UNITED STATE DEPARTMENT OF AGRICULTURE
Animal and Plant Health Inspection Service
Wildlife Services

ENVIRONMENTAL ASSESSMENT

BIRD DAMAGE MANAGEMENT IN WISCONSIN

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BIRD DAMAGE MANAGEMENT IN THE WISCONSIN WILDLIFE SERVICES PROGRAM

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WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR)

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION (WDATCP)

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Acronyms Used in the EA

AC	Alpha Chloralose
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BA	Biological Assessment
BBS	Breeding Bird Surveys
BGEPA	Bald and Golden Eagle Protection Act
BO	Biological Opinion
CDC	Centers for Disease Control and Prevention
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DOJ	Department of Justice
DP	Depredation Permit
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
INAD	Investigative New Animal Drug
LD	Lethal Dose
MA	Methyl Anthranilate
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MMWR	Morbidity and Mortality Weekly Report
MOU	Memoranda or Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NOA	Notice of Availability
NWHS	National Wildlife Health Center
NWRC	National Wildlife Research Center
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
T/E	Threatened and Endangered Species
TGE	Transmissible Gastroenteritis
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
WAC	Wisconsin Administrative Code
WS	Wildlife Services
WDACP	Wildlife Damage Abatement and Claims Program
WDATCP	Wisconsin Department of Agriculture, Trade and Consumer Protection
WDNR	Wisconsin Department of Natural Resources
WNV	West Nile Virus

SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), U.S. Fish and Wildlife Service (USFWS) and Wisconsin Department of Natural Resources (WDNR) propose to continue the current bird damage management program in the State of Wisconsin. WS, USFWS and WDNR use an Integrated Wildlife Damage Management (IWDM) approach to reduce bird damage to property, agricultural resources, natural resources, and human/public health and safety. In addition under the current program, the USFWS would continue to issue depredation permits based on need and recommendations from WS.

It is anticipated, based on historical information, that the majority of Wisconsin WS' bird damage management will be at livestock facilities to reduce European starling (*Sturnus vulgaris*) feed consumption and contamination with feces, and reduce potential risk of disease transmission to livestock. Wisconsin WS also works to reduce potential aircraft/bird strikes at airports in Wisconsin thereby minimizing human health and safety risks. Another important function of the Wisconsin WS program is the protection of property and aquacultural resources. This EA does not include actions that are authorized by the Public Resource Depredation Order[1] (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant (*Phalacrocorax auritus*) impact analysis (Chapter 4 of this EA) to determine any potential effects that may occur from the proposed action.

WS bird damage management would be conducted on public and private property in Wisconsin when the resource owner (property owner) or manager requests assistance. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods for preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under the current program, WS would provide technical assistance and operational damage management, including non-lethal and lethal management after applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed as humanely as possible using: shooting, trapping, registered pesticides and other products. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or could include instances where application of lethal methods alone would be the most appropriate strategy, particularly if human health and safety are compromised (*i.e.*, aircraft/bird strike threats).

[1] This EA only analyzes Wisconsin WS activities to manage double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Across the United States, wildlife habitat has been altered as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human-wildlife interactions. In addition, certain segments of the public strive for protection of all wildlife. Such protection can create localized conflicts between humans and wildlife. The Final Environmental Impact Statement (EIS) (USDA 1997) for the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program summarizes the relationship in North American culture of wildlife values and wildlife damage in this way:

> *"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife generally is regarded as providing economic, recreational and aesthetic benefits . . . , and the mere knowledge that wildlife exists is a positive benefit to many people. However, . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well."*

With this said, the wildlife acceptance capacity and biological carrying capacity must be applied to resolving wildlife damage management problems. The wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations. Biological carrying capacity is the land or habitat's ability for supporting healthy populations of wildlife without degradation to the species' health or their environment over an extended period of time (Decker and Purdy 1988). These phenomena are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there will be varying thresholds by those directly and indirectly affected by the species and any associated damage or their perspective. This damage threshold is a factor in determining the wildlife acceptance capacity. While Wisconsin may have a biological carrying capacity to support a higher population of some bird species that are analyzed in this document (see section 1.2) in many cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population or damage reduction methods, including lethal methods, to alleviate damage and public health or safety threats.

The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management and recognized as an integral component of wildlife management (The Wildlife Society 1992). WS uses an Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105[2]), commonly known as Integrated Pest Management where a combination of methods may be used or recommended to reduce wildlife damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel. Therefore, wildlife damage management is not based on punishing offending animals but is a means to reduce future damage and is implemented by considering the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often

[2] The WS Policy Manual provides WS personnel guidance in the form of program directives. Information contained in the WS Policy Manual and its associated directives has been used throughout this EA, but has not been cited in the Literature Cited appendix.

sufficient for individual actions to be initiated and the need for bird damage management is derived from the specific threats to resources. WS recognizes that birds have no *intent* to do harm. They inhabit (*i.e.*, reproduce, walk, forage, deposit waste, etc.) habitats where they can find a *niche*. If they do *"wrongs,"* people characterize this as damage. *Wrongs*, unfortunately, are determined not merely in spatial terms but also with respect to time and other circumstances that define the *wrongness* (*i.e.*, birds living in the wilds of Wisconsin may not be a problem while birds inhabiting an airport facility could cause human safety concerns, potential human injuries, and destruction of property.)

IWDM, described in USDA (1997, 1-7), includes methods such as habitat and behavioral modification to prevent or reduce damage or may require that the offending animal(s) be removed or that local populations or groups be reduced through lethal methods. Potential environmental affects resulting from the application of various bird damage management techniques are evaluated in this EA.

Normally, individual wildlife damage management actions could be categorically excluded (CE) from further National Environmental Policy Act (NEPA) analysis, in accordance with APHIS (7 CFR 372.5(c), 60 Fed. Reg. 6,000, 6,003, (1995)) implementing regulations for NEPA. WS and the U.S. Fish and Wildlife Service (USFWS) are preparing this Environmental Assessment (EA) to: 1) facilitate planning, interagency coordination, and the streamlining of program management; 2) clearly communicate to the public the analysis of individual and cumulative impacts of program activities; and 3) evaluate and determine if there are any potentially significant or cumulative adverse affects from the proposed program. All wildlife damage management conducted in Wisconsin would be undertaken in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531-1543). This analysis relies on existing data contained in published documents (Appendix A and Section 1.6) and USDA (1997) to which this EA is tiered.

1.2 WS PROGRAM AND USFWS MIGRATORY BIRD PERMITTING PROGRAM

1.2.1 WS Program

WS is the agency directed by Congress to protect American resources, property, and human health and safety from damage associated with wildlife (Act of March 2, 1931, 7 U.S.C. 426-426b; c. 370, § 1, 46 Stat. 1468-69; Dec 13, 1991, Pub. L. 102-237, Title X, § 1013(d), 105 Stat. 1901, as amended Oct. 28, 2000, Pub. L. 106-387, § 1(a) [Title VII], § 767], 114 Stat. 1549).

In 1988, Congress passed the "Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988" (7 U.S.C. 426c; Pub. L. 100-202, § 101(k) [Title I], Dec. 22, 1987, 101 Stat. 1329-331) which strengthened the Act of March 2, 1931 (Public Law 100-202).

In summary, Section 426 (the first section of the Act of March 2, 1931), as amended on October 28, 2000, authorizes the Secretary of Agriculture to *"... conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before October 28, 2000."*

(Section 426 formerly provided the Secretary of Agriculture with the authority to *"... conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory, or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground*

squirrels, jack rabbits, brown tree snakes, and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, fur-bearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other will [sic] animals; and to conduct campaigns for the destruction or control of such animals: Provided, That in carrying out the provisions of this section the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."

Under 7 U.S.C. §426c, the Secretary of Agriculture is also *authorized "... except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under such agreements into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

Under the Act of March 2, 1931, and 7 U.S.C. §426c, APHIS may carry out these wildlife damage management programs itself, or it may enter into cooperative agreements with States, local jurisdictions, individuals and public and private agencies whereby they may fund and assist in carrying out such programs. Id. These laws do not grant any regulatory authority. Therefore, there are no regulations promulgated under these statutes for wildlife services or animal damage control activities.

WS' mission (www.aphis.usda.gov/ws/mission.html), developed through its strategic planning process, is: 1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* This is accomplished through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Cooperative wildlife damage management programs;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1999).

WS is a cooperatively funded, service-oriented program. Before any wildlife damage management is conducted, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to effectively and efficiently reduce wildlife damage according to applicable Federal, State and local laws (WS Directive 2.210). WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds as specified in an MOU with the USFWS and in a cooperative agreement with the WDNR, and when funding allows.

1.2.2 USFWS Migratory Bird Permitting Program

The USFWS is the primary Federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve,

protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other Federal, State, tribal, and local entities; however, the USFWS has specific responsibilities for endangered species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters they administer for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting, taking, and killing of migratory birds subject to the provisions of, and in order to carry out the purposes of, the four migratory bird treaties.

The USFWS has authority for issuance of Depredation Permits (DPs) (50 CFR 21.41) to persons who clearly show evidence of migratory birds causing or about to cause damage. In Wisconsin, DPs issued by the USFWS are sent to the Wisconsin Department of Natural resources (WDNR) for review. If the WDNR concurs with the issuance of the DP they will co-sign the DP and forward it to the permittee. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Table 1-1 provides information on the number of requests for assistance WS received in fiscal years (FY) 00, 01, 02 and 03 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS.

Table 1-1. Requests for Assistance and DP Recommended by WS during FY 00, 01, 02 and 03.

FY	Resource Protected	Requests	DP Recommended
00	Agriculture	748	51
	Health & Safety	226	25
	Natural Resources	33	5
	Property	720	60
01	Agriculture	360	40
	Health & Safety	199	31
	Natural Resources	51	9
	Property	370	52
02	Agriculture	692	50
	Health & Safety	3,435	43
	Natural Resources	32	10
	Property	812	55
03	Agriculture	714	56
	Health & Safety	1,593	64
	Natural Resources	77	10
	Property	631	56

DPs are necessary under the MBTA and Bald and Golden Eagle Protection Act (BGEPA) for activities which *"take"* protected species. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but are required for species protected under the BGEPA. Additionally, any *"take"* of a threatened or endangered (T/E) species (which could be protected under MBTA, BGEPA and the ESA) could require multiple permits under all three acts.

1.3 PURPOSE OF THE EA

The purpose for preparing this EA is to determine if the proposed action could have a significant impact on the quality of the human environment, analyze other alternatives, coordinate efforts, inform the public

of the proposed action, and to comply with NEPA. This EA analyzes the potential effects of bird damage management, as coordinated with the WDNR, USFWS, Federal Aviation Administration (FAA), Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) and other State and Federal agencies, and private entities on all lands in Wisconsin under MOU, Cooperative Agreement, or other comparable document. The EA also addresses the effects of bird damage management on areas where additional agreements may be signed in the future. Because the current program and the proposed action are to conduct a coordinated bird damage management program in accordance with plans, goals, and objectives developed by WS, WDNR, USFWS, FAA and/or WDATCP to reduce damage, and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur. Thus, this EA anticipates these additional efforts and the analyses are intended to apply to actions that may occur *in any locale* and at *any time* within Wisconsin as part of a coordinated program.

The purpose of WS', the USFWS's and WDNR's bird damage management in Wisconsin is to minimize wild bird damage to agriculture (*e.g.,* crops, domestic animals), aquaculture, property (*e.g.*, structures), natural resources (*e.g.,* vegetation), and animal and human health and safety (*e.g.,* disease transmission, aircraft collisions). It is anticipated, based on historical information, that the majority of Wisconsin WS' bird damage management will be at livestock facilities to reduce European starling (*Sturnus vulgaris*) feed consumption and contamination with feces, and reduce potential risk of disease transmission to livestock. Another important function of Wisconsin WS' would also reduce potential aircraft/bird strikes at airports in Wisconsin to reduce human health and safety risks. In addition, other important functions of the Wisconsin WS program would be the protection of property and aquacultural resources[3].

WS', USFWS's and WDNR's involvement in bird damage management provides residents of Wisconsin and the WDNR measures to facilitate swift and more effective program delivery. Under the Proposed Action, bird damage management could be conducted under cooperative agreements, Memorandum of Understanding (MOU) or other comparable documents on private, Federal, State, tribal, county, and municipal lands in Wisconsin upon request for WS assistance and in coordination with the WDNR, USFWS, and tribal governments when requests for operational assistance are received. During FY00, 01, 02 and 03, Wisconsin WS technical and/or operational assistance was requested on 1,430 occasions when birds were damaging agricultural resources and on 7,300 occasions when birds were damaging property or natural resources and/or threatening human health/safety (Management Information System (MIS) 2000, 2001, 2002, and 2003[4]). WS' roles would be coordinated with the WDNR, USFWS, FAA and the WDATCP, as appropriate and consistent with other uses of the area. This EA does not cover Canada goose (*Branta canadensis*) damage management in Wisconsin that is conducted by WS. WS already has an EA for Canada goose technical or operational assistance projects (USDA 2000).

This EA evaluates alternatives by which the bird damage management responsibility of Wisconsin WS and the USFWS and WDNR could be conducted to resolve bird conflicts. The EA analyzes identified issues and alternatives and the impacts that they would have on a variety of species. WS identified 32 bird species for which they have received requests for assistance or information, or have provided operational bird damage management (Table 1-2). This list does not include feral and exotic species. The species analyzed in this EA include the following: American crows (*Corvus brachyrhynchos*), red-winged blackbirds (*Agelaius phoeniceus*), brewer's blackbirds (*Euphagus cyanocephalus*), brown-headed

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[3] This EA does not include actions that are authorized by the Public Resource Depredation Order (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant (*Phalacrocorax auritus*) impact analysis (Chapter 4 of this EA) to determine any potential impacts associate with the various alternatives. In addition, this EA only analyzes Wisconsin WS activities to manage double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

[4] WS' Annual Tables for FY 2003 are in draft format. Minor discrepancies may occur between data provided in this document and Wisconsin WS's final Annual Tables published on WS's website.

cowbirds (*Molothrus ater*), common grackle (*Quiscalus quiscula*), European starlings (starlings), house sparrows (sparrows) (*Passer domesticus*), rock doves (pigeon) (*Columba livia*), wild turkeys (*Meleagris gallopavo*), bald eagles (*Haliaeetus leucocephalus*), herring gulls (*Larus argentatus*), ring-billed gulls (*Larus delawarensis*), double-crested cormorants, killdeer (*Charadrius vociferous*), mallards (domestic/wild) (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), sandhill cranes (*Grus canadensis*), mourning doves (*Zenaida macroura*), mute swans (*Cygnus olor*), barn swallows (*Hirundo rustica*), cliff swallows (*Hirundo pyrrhonota*), belted kingfishers (*Ceryle alcyon*), great blue herons (*Ardea herodias*), red-tailed hawks (*Buteo jamaicensis*), great horned owls (*Bubo virginianus*), American kestrels (*Falco sparverius*), Cooper's hawk (*Accipiter cooperii*), turkey vultures (*Cathartes aura*), northern flickers (*Colaptes auratus*), downy woodpeckers (*Picoides pubescens*), hairy woodpeckers (*Picoides villosus*), pileated woodpeckers (*Dryocopus pileatus*) and feral, domestic and exotic birds. For emergency situations involving the protection of human health and safety (*i.e.*, bird/aircraft strikes), WS may take individuals of additional non-threatened and non-endangered species not listed in Table 1-2. These takes would occur on a case-by-case basis and are not anticipated to exceed one or two individuals of each species annually. This protocol is established via the USFWS Migratory Bird DP (permit # MB042886-0) issued to Wisconsin WS.

1.4 NEED FOR ACTION

1.4.1 Need for Bird Damage Management to Protect Agricultural Resources.

1.4.1.1 Livestock Feeds. Bird damage to agricultural crops has cost U.S. farmers more than $100 million annually (Besser 1985) and can pose significant economic threats to agricultural producers (Besser et al. 1968, Dolbeer et al. 1978, Feare 1984). As the science of raising cattle progressed from range to feedlots, bird problems intensified. Cattle in feedlots and dairies provide a tremendous feeding opportunity for birds. Along with modern agriculture facilities came the concept of the complete cattle diet. The complete diet contains all the nutrients and fiber that cattle need to increase weights, produce milk, and improve the flavor and texture of meat. The basic constituent of most rations is silage with the addition of barley, corn, or other grains which may be incorporated as whole, crushed or ground grains. The silage/grain mixture is normally combined with hay, or other high fiber roughage. While cattle are not able to select for certain ingredients, starlings and other birds select for grains, or other items, thereby altering the composition and energy value of the feed.

Livestock feed losses to starlings have been estimated by Besser et al. (1968) in feedlots near Denver, Colorado at $84 per 1,000 birds. Forbes (1995) reported starlings consume up to 50% of their body weight each day. Glahn and Otis (1981) reported consumption of about 10.5 lbs of pelletized feed per 1,000 bird minutes. The removal of high energy food ingredients is believed to reduce weight gains, milk yields, and is economically significant to individual producers (Feare 1984).

From FY00 thru FY03 WS responded to 10, 12, 181 and 169, respectively, requests for assistance from agriculture producers that were concerned about starlings consuming livestock feed or spreading diseases to livestock (MIS 2000, 2001, 2002, 2003). Because livestock producers are becoming more aware of the Wisconsin WS program, the number of complaints received by WS is expected to increase. During FY02, WS conducted the first operational projects in Wisconsin under CEs to reduce starling damage at 13 dairies by reducing livestock feed consumption/ contamination which increased to more than 30 farms during FY03. The value of contaminated or consumed livestock feed during FY02 was reported to exceed $13,000 (MIS 2002). During FY03 dairy producers reported that starlings consumed more than $21,500 of livestock feed (MIS 2003).

Table 1-2 Identified species and resources that WS routinely receives requests for assistance.

SPECIES	PROTECTED RESOURCES				
	Human Health & Safety (Aviation)	*Agriculture (aquaculture)*	*Agriculture (Field Crops)*	*Livestock (Feed or Animal Health)*	*Property (Buildings, Boats, Structures)*
American crow	X		X		X
Red-winged Blackbird	X		X	X	
Brewer's Blackbird	X		X	X	
Brown-headed cowbird	X		X	X	
Common grackle	X		X	X	
European Starling	X		X	X	
House Sparrow	X			X	X
Pigeon	X			X	X
Wild turkey	X		X		
Bald Eagle[1]	X			X	
Herring gull	X	X		X	X
Ring-billed gull	X	X		X	X
Killdeer	X				
Mallard	X				X
Blue-winged teal	X				
Sandhill crane	X		X		
Mourning dove	X				
Mute swan[2]	HHS/general				
Barn swallow	X				X
Cliff swallow	X				X
Belted kingfisher		X			
Great blue heron	X	X			
Double-crested cormorants		X			
Great horned owl	X				
Red-tailed hawk	X			X	
American kestrel	X				
Cooper's hawk	X				X
Turkey vulture	X			X	X
Northern flicker					X
Downy woodpecker					X
Hairy woodpecker					X
Pileated woodpecker					X

[1] Non-lethal management options only for this species.
[2] Work will not be conducted on this species until USFWS reauthorizes take under Wisconsin WS' migratory bird DP.

1.4.1.2 Aquaculture Resources. Bird damage to aquaculture resources can have significant economical impacts. The greatest economic losses result from double-crested cormorants feeding on channel catfish (*Ictalurus punctatus)* at aquaculture facilities in the southeastern United States. Stickley and Andrews (1989) estimated that Mississippi catfish farmers lose in excess of $3 million dollars annually to double-crested cormorants. In response to double-crested cormorants population expansion during the past 25 years, the USFWS has implemented an Aquaculture Resources Depredation Order[5] (50 CFR 21.47) modifying the legal protection for double-crested

5 This Depredation Order (50 CFR 21.47) does not apply to Wisconsin, but is referred to as background information for the reader.

cormorants. Wading birds including herons and egrets (Family *Ardeidae*) also cause significant economic losses to aquaculture production facilities. Hoy et al. (1989) estimated that wading birds feeding at a minnow facility may consume $0.10 to $1.12 per bird which could translate into a loss in excess of $10,000 for a three month period. In a survey of fish hatcheries in the eastern United States, Parkhurst et al. (1987) estimated that most hatcheries lost in excess of $7,600 worth of fish production to bird predation annually. In addition to direct losses through consumption, disease transmission from wild fish populations to aquaculture facilities or between aquaculture facilities may pose the greatest economic risk to fish hatcheries.

During FY 00, 01, 02 and 03, WS received requests for assistance from 13, 67, 91 and 68, respectively, individuals, State and private hatcheries, and commercial fishing facilities who reported various species of birds were depredating fish at aquaculture facilities. The total value of depredated aquaculture resources for the 4-year period was valued at more than $664,000 (MIS 2000, 2001, 2002, 2003). Great blue herons were reported as the depredating species in 54% of the complaints.

1.4.1.3 Field Crops. Waterfowl, sandhill cranes, turkeys, gulls and blackbirds can cause considerable damage to field crops. The amount of damage and subsequent monetary losses vary considerably each year based upon seasonal variations in migrations, spatial differences in crop placement, and temporal differences affecting planting and harvesting dates. Cleary et al. (1996) in "The Prevention and Control of Wildlife Damage" reported that waterfowl caused an estimated $12.6 million of damage in 1960 to small grains in the Canadian Prairie Provinces. In 1980 waterfowl were implicated in damaging $454,000 worth of small grains in North Dakota. Blackbirds routinely damage seeded and headed rice in Louisiana (Glahn and Wilson 1992) and headed sunflowers in the Dakotas (Linz et al. 1984, Homan et al. 1994, Linz and Hanzel 1997). Sandhill crane damage to corn, potatoes, and a variety of other crops has recently been identified as a loss of revenue to farmers in Wisconsin. Gull damage to agriculture and horticulture includes eating, pecking, trampling, and defecating on crops such as tomatoes, corn, soybeans, wheat, strawberries and fish (Blokloel and Tessier 1986). Blackbirds, crows, and blue jays (*Cyancitta cristata*) routinely damage ripening sweet and field corn. Even a small amount of damage on an ear of sweet corn will render the ear worthless because most people will not purchase a damaged ear of corn (Conover 2002).

Under a cooperative agreement with the WDNR and county Land Conservation Committees, WS conducts the Wildlife Damage Abatement and Claims Program (WDACP). This program was designed to provide abatement recommendations and financial assistance to farmers who suffer excessive damage to field crops caused by game animals such as, Canada geese, eastern wild turkeys, black bear (*Ursus americanus*) and white-tailed deer (*Odocoileus virginianus*). Consequently, WS routinely receives requests from farmers in counties where WS administers the WDACP. WS received 99 requests for assistance from farmers who reported either sandhill cranes, wild turkeys, or crows were damaging crops valued at more than $45,000 during FY03 (MIS 2003). During FY02 WS received or verified 42 cases where either sandhill cranes, blackbirds, turkeys, crows, or starlings damaging field crops with an estimated damage value exceeding $7,000 dollars (MIS 2002). WS received requests for assistance from 88 farmers during FY01 with damage in excess of $16,000 (MIS 2001). During FY00, WS received 316 requests for assistance to reduce agriculture field crop damage caused by sandhill cranes, crows, turkeys, and blackbirds. Reported damage during FY00 exceeded $54,053 (MIS 2000). During the four reporting years, sandhill cranes accounted for more than 50% of the reported agriculture field crop damage complaints (MIS 2000, 2001, 2002, 2003).

1.4.2 Need for Bird Damage Management to Protect Human Health and Safety;

Livestock Health; and Property

1.4.2.1 Human Health and Safety. Certain bird species are known vectors of diseases (zoonoses) that are transmittable to humans or they act as reservoirs that infect a host that spreads the disease to humans (Table 1-3) (Weber 1979, Conover 2002). Starlings, pigeons, house sparrows, and waterfowl are a few species that are carriers of different zoonotic diseases that have been contracted by humans. In addition, soils that are enriched by bird droppings, usually blackbirds, gulls and pigeons, have a tendency to promote the growth of the fungus, *Histoplasmosis capsulatum,* which is endemic to the U.S. (Southern 1986, Cleary et al. 1996). When disturbed, fungal spores become airborne and if inhaled may cause the respiratory disease *Histoplasmosis*. Ninety-five percent of people in the Ohio Valley test positive for *Histoplasmosis* exposure. However, infected people are usually asymptomatic. Ornithosis (*Chlamydia psittaci*) is another respiratory disease that can be contracted by humans, livestock, and pets. Pigeons are most commonly associated with the spread of Ornithosis to humans. Ornithosis is a virus that is spread through infected bird droppings when viral particles become airborne after infected bird droppings are disturbed. Various bird species are known reservoirs for the *Flavivirus* spp. that is responsible for the recent outbreaks of West Nile Virus (WNV) in the U.S. In FY02 and 03, WS received 1,840 and 1,219 requests for information concerning the ecology of WNV and potential transmission to humans from various bird species (MIS 2002, 2003).

Detecting contamination is relatively simple compared to the challenge of identifying where such contamination may originate. Fecal coliforms and *E. coli* are bacteria commonly used in water quality testing to detect fecal pollution. These organisms are present in high numbers in the gastrointestinal tract of almost all warm-blooded animals, and are therefore easy to detect in feces-contaminated water. Fecal coliforms and *E. coli* generally do not pose the actual health risk, but rather demonstrate the presence of fecal matter, which may carry numerous pathogenic (disease causing) organisms. The U.S. Environmental Protection Agency (EPA) has determined that if levels of *E. coli* exceed 235 organisms (Colony Forming Unit or CFU) per 100 mL of water, a health risk to humans may exist and recreational waters should be closed to the public.

Localized inputs of fecal bacteria from wildlife, such as waterfowl roosting on shorelines, can negatively impact water quality. According to a study conducted by Great Lakes Water Institute, University of Wisconsin, Milwaukee laboratory at a Milwaukee beach on Lake Michigan, *E. coli* levels reaching over 27,000 CFU/100 mL were found in an area where gulls routinely roost.

WS received 31, 42, 3156 and 1292 requests for information or assistance during FY00, 01, 02 and 03, respectively, concerning potential affects of zoonotic disease transmission by birds or direct threats to humans from birds (MIS 2000, 2001, 2002, and 2003).

Birds may also be responsible for creating human health and safety concerns that are not related to the aviation hazards or transmission of zoonotic diseases. For example, Wisconsin WS receives calls from residents concerning the aggressive nature of nesting raptors or wild turkeys that have become semi-domesticated and exhibit aggressive behavior towards people.

1.4.2.2 Human Health and Safety (Aviation). Bird hazards to aircraft and subsequent risks to public safety represent a serious concern about how wildlife can affect human health and safety. The evolution of aircraft design in the last three decades has resulted in faster and quieter aircraft. The rapid acceleration and increased speeds of jet turbine and modern propeller driven aircraft give birds less time to react to approaching aircraft. Also the amount of air traffic has increased substantially during the last two decades. In 1990 there were roughly 1,750 reported wildlife strikes compared to more than 4,500 in 1999 in the U.S. (Cleary et al. 2002). Between 1990 and

1999 there were 2,492 wildlife strikes in the U.S. that caused damage to aircraft, of these 85% were caused by birds (Cleary et al. 2002). The number of airports requesting assistance from WS nationwide with wildlife issues has increased from less than 50 in 1990 to more than 400 in 2000 (Cleary et al. 2002).

The FAA is responsible for setting and enforcing the Federal Aviation Regulations (FAR) and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. Airports involved in wildlife hazard management usually refer to "Wildlife Hazard Management at Airports" guidebook for conducting surveys or assessing potential wildlife risks at airports.

Bird damage to property can have important monetary impacts such as the ingestion of birds into a jet engine. During FY03 an aircraft struck an American kestrel at a southern Wisconsin airport causing approximately $50,000 worth of damage to the aircraft (MIS 2003). In FY01 an aircraft struck a herring gull at a southern Wisconsin airport causing about $20,000 in damage to the aircraft (MIS 2001). Therefore, WS, on a limited basis, has been providing assistance to airports in Wisconsin to resolve conflicts between wildlife and aviation traffic and to protect the traveling public. Work on these airports is being conducted under CEs to meet NEPA requirements. WS has written two wildlife hazard management plans for different airports and five formal wildlife hazard assessments that provided airports with the necessary information to identify problematic species, seasonal trends in specie abundance, abatement recommendation, and legalities surrounding the management of these species. As wildlife/aviation hazards are identified at different airports throughout Wisconsin the number of requests for assistance may increase. WS either verified or had reported 5, 43, 320 and 83 potential threats to aviation traffic from a variety of species in FY00, 01, 02 and 03, respectively (MIS 2000, 2001, 2002, and 2003). The bird species discussed/analyzed in this EA occur in Wisconsin and could occur on most airports in Wisconsin. If these birds present an aircraft/bird strike hazard or potential hazard, WS would respond with appropriate actions. Those actions could be non-lethal or lethal depending on the case-by-case situation as evaluated by WS and airport personnel and authorized by WS migratory bird DP (permit # MB042886-0).

Nationally, bird strikes cause an estimated seven fatalities and $245 million damage to civilian and military aircraft each year (Conover et al. 1995). According to FAA records, approximately 555 bird strikes to civil aircraft were reported in Wisconsin from FY90 through 04 (FAA database, wildlife.pr.erau.edu/public/index1.html). Of those strikes reported to commercial aircraft, 209 strikes were from unknown species and gulls accounted for 127; the number of bird strikes to military aircraft in Wisconsin is unavailable. However, it is estimated that only 20 to 25% of all bird strikes are reported (Conover et al. 1995, Dolbeer et al. 1995, Linnell et al. 1996, Linnell et al. 1999), consequently, the number of bird strikes in Wisconsin is most likely much higher than FAA records indicate.

1.4.2.3 Livestock Health. Pigeons, starlings, sparrows, and blackbirds have been implicated in the transmission of diseases significant to livestock production (Table 1-3). Pigeons and starlings have been shown to be vectors of transmissible gastroenteritis (TGE) virus of swine. This disease is usually fatal to young pigs and may result in weight loss for adults. Starlings are probably an important carrier of TGE. The virus can remain alive on their feet and feathers for up to 30 hours resulting in the spread of TGE between livestock facilities (Cleary et al. 1996). Starlings also may be involved in the transmission of hog cholera. Cryptococcosis is a fungal disease spread by pigeons and starlings to livestock that may result in chronic, usually fatal, meningitis.

Table 1-3. Diseases transmissible to humans and livestock associated with feral domestic pigeons, starlings, and sparrows (Weber 1979).

Disease	Human Symptoms	Potential for Human Fatality	Effects on Domestic Animals
Bacterial:			
Erysipeloid	skin eruption with pain, itching; headaches, chills, joint pain, prostration, fever, vomiting	sometimes - particularly to young children, old or infirm people	serious hazard for the swine industry
Salmonellosis	gastroenteritis, septicemia, persistent infection	possible, especially in individuals weakened by other disease or old age	causes abortions in mature cattle, possible mortality in calves, decrease in milk production in dairy cattle
Pasteurellosis	respiratory infection, nasal discharge, conjunctivitis, bronchitis, pneumonia, appendicitis, urinary bladder inflammation, abscessed wound infections	rarely	may fatally affect chickens, turkeys and other fowl
Listeriosis	conjunctivitis, skin infections, meningitis in newborns, abortions, premature delivery, stillbirth	sometimes - particularly with newborns	In cattle, sheep, and goats, difficulty swallowing, nasal discharge, paralysis of throat and facial muscles
Viral:			
Meningitis	inflammation of membranes covering the brain , dizziness, and nervous movements	possible — can also result as a secondary infection with listeriosis, salmonellosis, cryptococcosis	causes middle ear infection in swine, dogs, and cats
Encephalitis (7 forms)	headache, fever, stiff neck, vomiting, nausea, drowsiness, disorientation	mortality rate for eastern equine encephalomyelitis may be around 60%	may cause mental retardation, convulsions and paralysis
Mycotic (fungal):			
Aspergillosis	affects lungs and broken skin, toxins poison blood, nerves, and body cells	not usually	causes abortions in cattle
Blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	rarely	affects horses, dogs and cats
Candidiasis	infection of skin, fingernails, mouth, respiratory system, intestines, and urogenital tract	rarely	causes mastitis, diarrhea, vaginal discharge and aborted fetuses in cattle
Cryptococcosis	lung infection, cough, chest pain, weight loss, fever or dizziness, also causes meningitis	possible especially with meningitis	chronic mastitis in cattle, decreased milk flow and appetite loss
Histoplasmosis	pulmonary or respiratory disease. May affect vision	possible, especially in infants and young children or if disease disseminates to the blood and bone marrow	actively grows and multiplies in soil and remains active long after birds have departed
Protozoal:			
American Trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons
Toxoplasmosis	inflammation of the retina, headaches, fever, drowsiness, pneumonia, strabismus, blindness, hydrocephalus, epilepsy, and deafness	possible	may cause abortion or still birth in humans, mental retardation
Rickettsial/ Chlamydial:			
Chlamydiosis	pneumonia, flu-like respiratory infection, high fever, chills, loss of appetite, cough, severe headaches, generalized aches pains, vomiting, diarrhea, hepatitis, insomnia, restlessness, low pulse rate	occasionally, restricted to old, weak or those with concurrent diseases	in cattle, may result in abortion, arthritis, conjunctivitis, and enteritis
Q Fever	sudden pneumonitis, chills, fever, weakness, severe sweating, chest pain, severe headaches and sore eyes	possible	may cause abortions in sheep and goats

In addition, a dairy operator in Taylor County, Wisconsin and his consulting veterinarian highly

suspected that starlings were responsible for transmitting Salmonella to his dairy cattle where 40 Holstein diary calves died from the disease. The monetary damage from the dead calves and associated veterinary bills was approximately $21,000. The northern fowl mite found on pigeons is an important poultry pest (Cleary et al.1996). In addition to the spread of zoonotic diseases to livestock, WS also receives requests for assistance concerning birds of prey depredating domestic fowl.

WS received requests for assistance from 87 farmers who were concerned about starlings transmitting diseases to either cattle (84) or swine (3) during FY 2002 compared to only one request during FY01 (MIS 2001, 2002). WS provided information to livestock producers during the fall of 2001 which increased farmer awareness of a WS' program that could assist them to reduce starling damage or potential damage at their facilities. The number of requests for assistance to reduce starling damage or potential damage at livestock facilities is expected to increase during the next several years. WS received 28, 27, 116 and 83 requests overall during FY00, 01, 02 and 03, respectively, to help protect livestock health or prevent predation of domestic fowl (MIS 2000, 2001, 2002, 2003).

1.4.2.4 Property. Property damage caused by birds can entail numerous resources and usually is not important nationally but may be significant on a local or regional basis. Woodpecker damage to residential dwellings from a national perspective is minimal; however, from a local perspective may cause home owners thousands of dollars in related damages. Instances of property damage from birds may consist of barn swallow nests under eaves and bridges or bird droppings defacing property. In another instance, the City of Madison reported that barn swallows cost the City $500,000 by delaying major reconstruction of a bridge (MIS 2002). During FY02 WS received 24 complaints from building managers that reported herring and ring billed gulls caused more than $150,000 of physical damage to commercial building roof tops (MIS 2002). And a marina in southern Wisconsin reported that it cost boat owners nearly $50,000 in clean up costs to remove gull droppings from moored watercraft. In FY02 more than 110 residents reported damage to their homes from downy and hairy woodpeckers with estimated repair costs exceeding $33,000 (MIS 2002) and during FY00 WS received more than 180 requests for assistance to resolve woodpecker damage to residential buildings (MIS 2000). Total reported damage that year was estimated at more than $27,000.

1.4.3 Nuisances. Certain bird species and their associated nesting material and droppings may create nuisances or safety hazards. Cliff swallows for instance may create a nuisance with their nests and droppings when they nest in large numbers on buildings or homes. Their nests may foul machinery, create aesthetic problems, and when they fall to the ground create similar problems. Pigeon droppings can deface signs and cause significant losses to sign companies attempting to maintain billboards. Accumulations of pigeon droppings may produce an objectionable odor, accelerate deterioration of buildings and increase maintenance costs. Pigeon manure deposited on park benches, cars, statues, and unwary pedestrians is aesthetically displeasing. House sparrows and starlings may damage buildings by pecking foam insulation and create aesthetic problems with their droppings and nesting materials. They may also create fire hazards by placing nesting material near electrical wiring and light fixtures. Gulls create nuisances when they nest on roof tops and attempt to gain food from people eating outdoors (Dolbeer et al. 1990). Roof-nesting gulls are undesirable because that cause damage to structures, plug drains with nesting material and food remains, defecate on vehicles, and harass maintenance personnel (Belant 1993). WS received 92, 101, 163 and 135 requests for information or assistance from people who reported that a wide variety of bird species were creating nuisances during FY00, 01, 02 and 03, respectively (MIS 2000, 2001, 2002, 2003).

1.4.4 Natural Resources

Encroachment by some bird species is a concern of some resource management agencies. Starlings usurp nest sites from wood ducks (*Aix sponsa*), bluebirds (*Sialia* spp.), woodpeckers, and many other secondary cavity nesters (Grabill 1977, Weitzel 1988, Ingold 1989). Brown-headed cowbirds parasitize songbird nests, leading to concern by some wildlife biologists for the well-being of neotropical migrant species (Brown 1994). With endangered bird species, such parasitism can cause enough nest failures to jeopardize the host species. Cowbirds have parasitized more than 220 host species, ranging from the black-capped vireo (*Vireo atricapillus*) and wood thrush (*Hylocichla mustelina*) to the blue-winged teal (*Anas discors*) and red-headed woodpecker (*Melanerpes erythrocephalus*). Starlings may also parasitize the nests of other species by destroying eggs or hatchlings (Fielder et al. 1990, Grabill 1977, Peterson and Gauthier 1985).

Ring-billed and herring gulls encroaching on the nesting habitat of other migratory bird species is also a concern. This is especially true for the common tern (*Sterna hirundo*) which is a species of management concern. Gulls arrive at colony sites well in advance of many species and simply take over traditional nesting sites and thus force the other species to nest in less suitable habitat or to abandon the site (Courtney and Blokpoel 1983). The potential for gull predation on piping plover (*Charadrius melodus*) chicks is also a concern to management agencies (USFWS 2000) The Great Lakes population of piping plover is listed as an endangered species.

Because of the predatory or invasive nature of some bird species, WS could foreseeable be requested to help reduce conflicts for the overall protection and conservation of some bird species.

1.5 Summary of Current and Proposed Action

WS' and UFSWF's current and proposed program is to continue to administer an adaptive IWDM program to alleviate bird damage to agriculture (*e.g.*, crops and domestic animals), property (*e.g.*, structures), natural resources (*e.g.*, interspecific competition), and animal and human health and safety (*e.g.*, disease transmission, aircraft/bird strikes). It is anticipated, based on historical information, that the majority of the bird damage management will be at livestock facilities to reduce starling feed consumption and contamination with feces, and reduce potential risk of disease transmission to livestock. Another important function of the program would also reduce potential aircraft/bird strikes at airports in Wisconsin to reduce human health and safety risks. In addition, other important function would be the protection of property and aquacultural resources. This EA does not include actions that are authorized by the Public Resource Depredation Order[6] (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant impact analysis (Chapter 4 of this EA) to determine any potential affects that may occur from the proposed action.

An IWDM program would be implemented on private and public lands of Wisconsin[7] where a need exists, a request is received and funding is available. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods to prevent or reduce damage while

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[6] This EA only analyzes Wisconsin WS activities to manage double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

[7] This EA addresses bird damage management on a statewide basis on lands under cooperative agreement or other comparable documents because wildlife, especially birds in this case, are jointly managed by the WDNR and USFWS under statewide statutes, laws, regulations and policies. WS would consult with the WDNR and USFWS on a regular basis to insure no adverse impacts to wildlife populations or other resources of the State occur.

minimizing harmful effects of damage management measures on humans, other species, and the environment. Under the proposed action, WS would provide technical assistance and operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model[8] (Slate et al. 1992) to help determine the most appropriate action(s) to take. When appropriate, habitat modifications, harassment, repellents, and physical exclusion could be recommended and utilized to reduce bird damage. In other situations, birds could be removed as humanely as possible by utilizing shooting, registered pesticides and live capture followed by relocation[9] or euthanasia under permits issued by the WDNR or USFWS. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage or potential damage situation. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. Bird damage management would be conducted in the State, when requested and after consultation with the USFWS, WDNR, FAA and/or WDATCP, as appropriate, on private or public property after an *Agreement for Control* or other comparable document has been completed. During FY00, 01, 02 and 03 WS provided technical assistance services to residents across the entire State of Wisconsin. In addition, consultations with the WDNR and USFWS may be appropriate to ensure WS actions do not adversely affect State and Federal T/E species.

1.5.1 Area of Analysis. Wisconsin encompasses about 54,375 mi^2, not including those parts of the Mississippi River and Great Lakes located within the boundaries of the State. Excluding Canada geese, during FY00, 01, 02 and 03, WS had 67 signed *Agreements for Control* to conduct bird damage management on 17,121acres (about 0.05% of the land area of Wisconsin). However, WS generally only conducts bird damage management on a small portion of the properties under *Agreement* in any year. In FY00, 01, 02, and 03 operational bird damage management projects were conducted on 5,372, 2,901, 5,271 and 3,577 acres, respectively (MIS 2000, 2001, 2002, and 2003). Although the area worked by WS is relatively small in relation to the State, the projects are considered important to the requesters and others.

1.6 Relationship of This EA to Other Management and Environmental Documents

1.6.1 WS Programmatic EIS. WS has issued a programmatic EIS which analyzed program activities (USDA 1997) and Record of Decision on the National APHIS-WS program. This EA is tiered to USDA (1997).

1.6.2 Management of Conflicts Associated with Resident Canada Geese in Wisconsin EA. WS completed a state-wide EA for resident Canada goose management in Wisconsin in 2000. Issues relating to Canada geese were addressed in that document and will not be reanalyzed in this EA (USDA 2000).

1.6.3 USFWS Mute Swan Environmental Assessment and Finding of No Significant Impact. In August 2003, the USFWS issued a Finding of No Significant Impact (FONSI) and a Final EA for the management of mute swans in the Atlantic Flyway which will support implementation of the Atlantic Flyway Mute Swan Management Plan (USFWS 2003a). Pertinent and current information contained in the USFWS Mute Swan EA has been incorporated by reference into this EA.

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[8] The WS Decision Model is not a written process but rather a mental problem solving process to determine appropriate management actions to take.

[9] It is often unwise, unnecessary and biologically unsound to relocate damaging birds because they are often abundant and this would potentially cause damage in the new location or they would return to the original location. WS, however, would consider relocating birds if it is deemed biologically sound and a permit was issued by the WDNR or USFWS.

1.6.4 Final Environmental Impact Statement: Double-crested Cormorant Management. The USFWS has issued a Final EIS on the management of double-crested cormorants (USFWS 2003b). Pertinent and current information available in the EIS has been incorporated by reference into this EA[10].

1.6.5 Final Environmental Assessment Depredation Permits for the Control and Management of Gulls in the Great Lakes Region. The USFWS Region 3 prepared an EA and signed a FONSI (12/2000) for the management of ring-billed and herring gull damage to protect human health and safety, property and the productivity of other colonial water birds. The USFWS selected the No Action Alternative which supports the current program whereby the USFWS would continue to issue DP.

1.6.6 Executive Order (EO) 13186 and MOU between USFWS and WS. EO 13186 directs agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between agencies and American Indian tribes. A National-level MOU between the USFWS and WS is being developed to facilitate the implementation of Executive Order 13186.

1.6.7 Invasive Species EO 13112 - Authorized by President Clinton, EO 13112 establishes guidance to agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, 4) provide for environmentally sound control, and 5) promote public education on invasive species.

1.7 Decision to Be Made

Based on agency relationships, MOUs and legislative mandates, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The WDNR, USFWS, FAA and WDATCP had input during preparation of the EA to ensure an interdisciplinary approach in compliance with NEPA and agency mandates, policies and regulations. As a cooperating agency, the USFWS may adopt this EA and make and document their own decision.

Based on the scope of this EA, the decisions to be made are:

- Should WS, USFWS and WDNR conduct a coordinated bird damage management program in Wisconsin to alleviate damage to agriculture, property, natural resources, and human health and safety?
- What mitigation measures should be implemented by WS, USFWS and WDNR?
- Would the proposed action have significant impacts on the quality of the human environment requiring preparation of an EIS?

1.8 Scope of This Analysis

[10] This EA does not include actions that are authorized by the Public Resource Depredation Order (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant impact analysis (Chapter 4 of this EA) to determine any potential affects that may occur from the proposed action. This EA only analyzes Wisconsin WS activities to manage double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

1.8.1 Actions Analyzed. This EA evaluates bird damage management to protect agriculture, aquaculture, property, natural resources, and human and animal health and safety as coordinated with the WDNR, USFWS, FAA and/or WDATCP.

1.8.2 American Indian Lands and Tribes. Currently WS does not have any MOUs or signed agreements with any American Indian tribes in Wisconsin. Any WS activities conducted on tribal lands would only be conducted at the request of the tribe and after appropriate authorizing documents were signed. Therefore, WS would only conduct bird damage management activities on tribal lands after agreements with the tribes to conduct such activities are in place. If WS enters into an agreement with a tribe for bird damage management, this EA would be reviewed and supplemented, if appropriate, to ensure NEPA compliance. Requests for operational assistance to resolve bird damage complaints on private properties within the boundaries of Indian reservations would be coordinated with tribal governments.

1.8.3 Resources Not Currently Protected by WS Bird Damage Management. The current bird damage management program operates on a small percentage of properties in Wisconsin as stated in Section 1.5.1. This EA analyzes affects not only at the current program level, but at increased program levels should individuals or agencies request assistance. Any increase is anticipated to be small with very few additional affects.

1.8.4 Period for which this EA is Valid. If it is determined that an EIS is not needed, this EA will remain valid until Wisconsin WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA analysis is sufficient.

1.8.5 Site Specificity. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever bird damage, or potential bird damage occur and the resulting management actions taken. WS personnel use the WS Decision Model (Slate et al. 1992) as the *"on the ground"* site-specific procedure for each damage management action conducted by WS. The Decision Model is a thought process that guides WS though the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (see Chapter 3, Section 3.3.3 for a description of the Decision Model). The Decision Model (Slate et al. 1992) and WS Directive 2.105 describe the site-specific thought process that is used by WS. Decisions made using the model would be in accordance with plans, goals, and objectives of WS, USFWS, WDNR, FAA and/or WDATCP and any mitigations and standard operating procedures (SOP) described herein and adopted or established as part of the decision.

WS, USFWS, WDNR, FAA and WDATCP analyzed the current program and proposed action, and the other alternatives in this EA against the issues that were raised. These issues were analyzed at levels that are *"site specifically"* appropriate for this action in Wisconsin. Determining affects requires that WS look at the *context* of the issue and *intensity* of the action. The range of bird populations is seldom a few acres or farm but rather over a much larger area that includes different land ownerships and political boundaries. Damage management actions are generally conducted on a much smaller portion of the habitat occupied by the target birds (see Section 1.5.1). As professional wildlife biologists, WS, WDNR and USFWS analyze affects to bird populations, and that the damage situation with birds may change at any time in any location; wildlife populations are dynamic and mobile.

In summary, WS, USFWS, WDNR, FAA and WDATCP have prepared an EA that provides as much information as possible to address and predict the locations of potential bird damage management actions and coordinates efforts with WS, the WDNR, USFWS, FAA and/or WDATCP, as appropriate, to insure that native bird populations remain healthy and viable in the State. Thus, the EA addresses substantive environmental issues pertaining to bird damage management in Wisconsin. To reduce damages, WS provides technical assistance and demonstrations to help prevent the need for operational damage management. WS can and does provide an analysis of affects of their actions and affects to reduce bird damage within the scope of the EA. The site-specificity problem occurs when trying to determine the exact location an animal would cause damage before the damage situation occurs. By using the Decision Model (Slate et al. 1992), WS believes it meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to accomplish its mission. WS determined that a more detailed and more site-specific level of analysis would not substantially improve the public's understanding of the proposal, the analysis, the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995). In addition, in terms of considering cumulative impacts, one EA analyzing affects in Wisconsin will provide a better analysis than multiple EA's covering smaller zones within Wisconsin.

1.8.6 Public Involvement/Notification. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS-NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" (NOA) published in local media and through direct mailings to parties that have specifically requested to be notified[11]. New issues or alternatives raised after publication of this EA will be fully considered to determine whether the EA should be revisited and, if appropriate, revised.

1.9 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four Chapters and three Appendices. Chapter 2 discusses the issues, issues not analyzed in detail, and affected environment. Chapter 3 describes each alternative, alternatives not considered in detail, mitigation and SOPs. Chapter 4 analyzes the environmental impacts associated with each alternative considered in detail. Chapter 5 is a list of preparers, consultants and reviewers. Appendix A is the literature cited, Appendix B discusses the legal authorities of Federal and State agencies in Wisconsin, and Appendix C describes bird damage management methods available for use in Wisconsin.

[11] It is entirely possible that an urgent need, such as threats to the traveling public could require that action be taken prior to reaching a decision. None of the planners and decision makers involved in this effort is precluded from considering comments filed in this process at any time (even after actions to deal with the threat have begun) and making appropriate adjustments to ongoing program operations.

CHAPTER 2: AFFECTED ENVIRONMENT AND ISSUES

2.1 INTRODUCTION

Chapter 2 discusses the issues, including issues that will receive detailed analysis in Chapter 4 (Environmental Consequences), and issues that will not be considered in detail, with the rationale. Pertinent portions of the affected environment will be addressed in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments will be incorporated into the discussions of the environmental impacts in Chapter 4.

2.2 AFFECTED ENVIRONMENTS

Wisconsin encompasses 54,375 mi^2, not including those parts of the Mississippi River and Great Lakes located within the boundaries of the state. Its inland lakes, covering more than 982,000 acres, make up almost 3% of the state's total surface area. Most of Wisconsin's largest lakes are concentrated in the northern two-thirds of the state, and they include artificial bodies of water created by dams. The state's four highest recorded elevations are Timms Hill, Pearson Hill, Sugarbush Hill, and Rib Mountain, but none exceeds 2,000 feet in altitude. These sites are concentrated in the north central portion of the state. In 1999, the annual statewide average temperature was 45.5° F. Across the state, normal regional temperatures vary from 40.2° in the north central area to 46.2° in the southeast. In 1999, the total statewide average rainfall was 34.06 inches. Regional precipitation averages varied from a high of 37.94 inches in the southwest to a low of 30.16 inches in the northeast (Wisconsin Blue Book 2001-2002, www.legis.state.wi.us/lrb/bb/01bb/index.htm).

2.2.1 Airports. Collisions between aircraft and wildlife are a concern throughout the world because they threaten passenger safety (Thorpe 1996), result in lost revenue and costly repairs to aircraft (Linnel et al. 1996), and can erode public confidence in the airport transportation industry as a whole (Conover et al. 1995). Birds as a group represents the largest segment of wildlife populations that present hazards to aircraft, and therefore are considered a serious threat to human safety when found on or near airports.

2.2.2 State/Federally Owned Properties. State or Federal properties in urban and/or rural areas may be affected by birds causing damage to property, landscaping, natural resources, or threaten the health and safety of personnel working or living on the property. When bird problems arise on State or Federal properties, WS assistance to reduce damage and human health risks may be requested.

2.2.3 Urban and Suburban Areas. Public and private properties in urban/suburban areas may also be affected when birds cause damage to landscaping, natural resources, and property or affect human health and safety.

2.2.4 Agricultural, Aquacultural, Rural, and Forested Areas. Other areas of proposed action include farms, forested areas, aquacultural facilities, hatcheries or nurseries, and rural areas where birds are causing or potentially cause disease transmission and damage to agriculture crops, livestock and feed, property, and natural resources.

2.3 ISSUES ANALYZED IN DETAIL

The following issues have been identified as areas of concern requiring detailed analysis in Chapter 4 of this EA:

- Cumulative Effects of WS Bird Damage Management on Target Species Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Animals
- Efficacy of WS Bird Damage Management Methods

2.3.1 Cumulative Effects of WS Bird Damage Management on Target Species Populations. A common concern among members of the public and wildlife professionals, including WS personnel, is the effect of bird damage management on the target species population. WS' take of target species is small in comparison to the overall population of these species and many species WS conducts activities are considered "*anthropogenic abundant*" (Conover 2002). Quantitative population data for most species is not available however population trend data *(i.e.,* qualitative) exists from the breeding bird survey (BBS) data base (Sauer et al. 2004) for most species. The anticipated take of most species in a year would be less than 50 individuals. However, the take for certain species, such as starlings, could be considerably more. Monitoring of WS' take will be conducted at least annually and activities for the MBTA protected species coordinated with the USFWS. A detailed analysis concerning WS' effect to target species populations is conducted in Chapter 4.

2.3.2 Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species. A common concern among members of the public and wildlife professionals, including WS personnel, is the effect of bird damage management on non-target species, particularly T/E species. WS' uses an IWDM approach to reduce effects on non-target species' populations which is described in Chapter 3.

To reduce the risks of adverse effects to non-target species, WS would select methods that are as target-selective as possible or apply such methods in ways to reduce the likelihood of adversely affecting non-target species populations. Prior to the application of DRC-1339, for example, pre-baiting is required to monitor for non-target species that may consume treated bait. If non-target species that could consume treated bait are observed, then the use of DRC-1339 would be postponed or not applied. For trapping activities, WS would select trapping locations that are highly used by the target species and use baits that are preferred by the target species.

WS uses trained professional employees to conduct bird damage management programs in Wisconsin. Employees would monitor work areas where bird damage management is scheduled to be conducted and notify the USFWS if a federally listed species was observed. There are 16 federally listed T/E species and one candidate species in Wisconsin. WS prepared a BA and determined the proposed bird damage management action would have no effect on all federally listed species in Wisconsin except the bald eagle. However, the BA determined that the proposed action would not likely adverse effect the bald eagle and may be beneficial to the eagle and the traveling public if a bald eagle were dispersed from airport property (J. Smith, Ecological Services, USFWS letter to David Nelson, WS, May 28, 2004 and Intraagency Consultation).

2.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets. The primary pesticide used and proposed for use by Wisconsin WS is DRC-1339. DRC-1339 is one of the most extensively studied chemicals and causes a quiet, uneventful, and apparently painless death (USDA 1995, 1997). DRC-1339 is regulated by the EPA through the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), by the WDATCP through Chapter ATCP 29, Wis. Adm. Code (Pesticide Use and Control), and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used according to label directions, they are highly selective to target individuals or populations, and

such use has negligible impacts on the environment (USDA 1997). In addition, the Wisconsin WS program properly disposes of any excess solid or hazardous waste.

Shooting with shotguns, air rifles, and other firearms is selectively used for the target species and helps to reinforce bird scaring and harassment efforts. Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are also required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

In addition, WS may use several types of live traps to capture target birds. These include: clover, funnel, and common pigeon traps, decoy traps, nest box traps, mist nets, cannon and rocket nets, net gun, pole traps, and bal-chatri traps. As these traps are live or cage-type traps, animals can be released without harm and the traps pose no risks to the public or domestic pets.

2.3.4 Efficacy of WS Bird Damage Management Methods. Under the current and proposed Wisconsin program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992), WS Directives and relevant Federal and State laws and regulations. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method, and the guidance provided by WS Directives and policies for WS personnel.

WS personnel are trained in the effective use of each bird damage management method. All WS personnel applying pesticides are certified by WDATCP as restricted-use pesticide applicators. If shooting is determined to be an effective method for a specific bird damage problem, all personnel utilizing firearms receive training on the safe use of firearms (see Section 2.3.3).

WS believes that it is important to maintain the widest possible selection of damage management methods to effectively resolve bird damage problems. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors (see Appendix C for a more detailed discussion of methods).

2.4 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.4.1 WS' Impact on Biodiversity. No WS bird damage management in Wisconsin is conducted to eradicate a native wildlife species. WS operates according to international, Federal, and State laws and regulations (and management plans thereof) enacted to ensure species viability. In addition, any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. The affects of the current WS program on biodiversity are minor and not significant nationwide, statewide, or region wide (USDA 1997). WS operational programs primarily targeted starlings and pigeons which are introduced exotic species that do not add to the avian biodiversity of Wisconsin. Further, WS operates on an extremely small percentage of the land area of the State (<1.2% of the State) (see Section 1.5.1) and WS' take of any wildlife species analyzed in this EA is a small proportion of the total population and insignificant to the viability and health of the total population.

2.4.2 Humaneness of WS Bird Damage Management Methods. The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if " *. . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering is described as a "*. . . highly unpleasant emotional response usually associated with pain and distress.* However, suffering "*. . . can occur without pain . . .*,"and "*. . . pain can occur without suffering . . .*" (American Veterinary Medical Association (AVMA) 1987). Because suffering carries with it the implication of a time frame, a case could be made for "*. . . little or no suffering where death comes immediately . . .*" (California Department of Fish and Game (CDFG) 1999), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would "*. . . probably be causes for pain in other animals . . .*" (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1999).

Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since "*. . . neither medical or veterinary curricula explicitly address suffering or its relief*" (CDFG 1999).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of human and animal suffering with the constraints imposed by current technology and funding.

WS has improved the selectivity and humanness of management techniques through research and development and research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some bird damage management methods are used in situations where non-lethal damage management methods are not practical or effective.

Wisconsin WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

2.4.3 Effects of WS Bird Damage Management Methods on Aesthetic Values. The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public is no exception and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward these animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

There is some concern that the proposed action or the action alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally

is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987, USDA 1997), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics are truly subjective in nature, dependent on what an observer regards as beautiful (see Section 1.1).

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (*e.g.*, wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (*e.g.*, reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to natural ecosystems (*e.g.*, ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using up the animal or intending to) or non-consumptive use (viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is the knowledge that the animals exist (Decker and Goff 1987).

Wisconsin WS recognizes that all wildlife has aesthetic value and benefit. WS only conducts bird damage management at the request of the affected home/property owner or resource manager and management actions are carried out in a caring, humane, and professional manner.

2.4.4 Bird Damage is a Cost of Doing Business – a "Threshold of Loss" Should Be Established Before Allowing any Lethal Bird Damage Management. WS is aware of concerns that Federal bird damage management should not be allowed until economic losses become unacceptable. However, this type of policy would be inappropriate to apply to public health and safety situations. In addition, some losses can be expected and tolerated by agriculture producers and property owners, WS has the legal responsibility and direction to respond to requests for bird damage management, and it is program policy to aid each requester to minimize losses. The WS Decision Model (Slate et al. 1992) is used to determine an appropriate strategy.

Furthermore, in a ruling for *Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie NF, et al.*, the United States District Court of Utah denied plaintiffs' motion for preliminary injunction. In part the court found that it was only necessary to show that damage from wildlife is threatened, to establish a need for wildlife damage management (U.S. District Court of Utah 1993).

2.4.5 Bird Damage Management Should Not Occur at Taxpayers Expense, but Should Be Fee Based. Funding for WS comes from many sources besides Federal appropriations. Such non-federal sources include various state appropriations, local government funds (county or city), and private funds that are all applied toward program operations. WS was established by Congress as the program responsible for providing wildlife damage management to the people of the United States. Federal, state and local officials have decided that WS should be conducted by appropriating funds. Additionally, wildlife damage management is an appropriate sphere of activity for government programs, since wildlife is publicly owned and wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage management is that the public should bear the responsibility for damage to private property caused by public wildlife. The protection of agricultural resources, property, and public health

and safety will always be conducted by someone. A Federal WS program provides a service to the agricultural producers, protects property, natural resources, and public health and safety, and conducts an environmentally, economically, and biologically sound program in the public interest.

Currently, Wisconsin WS provides free technical assistance on bird damage management to citizens, private business, and government agencies. Operational damage management may be initiated when the problem cannot effectively be resolved through technical assistance alone, and when *Agreements for Control* or other comparable instruments provide for WS operational damage management, and when the necessary funds are made available. Thus, the primary focus of WS operational bird damage management in Wisconsin is fee based.

2.4.6 Impacts of West Nile Virus (WNV) on Bird Populations. WNV is a mosquito–borne virus that emerged in recent years in temperate regions of North America, with the first appearance of the virus in North America occurring in New York City in 1999 (Morbidity and Mortality Weekly Report (MMWR) 2002, Rappole et al. 2000). The virus, which causes encephalitis, or inflammation of the brain, has been found in Africa, Western Asia, the Middle East, the Mediterranean region of Europe, and, now in the United States. Mosquitoes acquire WNV from birds and pass it on to other birds, animals, and people. While humans and horses may be infected by the virus, there is no documentation that infected horses can spread the virus to uninfected horses or other animals. Migrating birds appear to play a role in spreading the disease.

WNV has spread across the United States since 1999 and was reported to occur in 44 states and the District of Columbia in 2002 (MMWR 2002). WNV is typically transmitted between birds and mosquitoes. Mammals can become infected if bitten by an infected mosquito, but individuals in most species of mammals do not become ill from the virus. The most serious manifestation of the WNV is fatal encephalitis in humans, horses, and birds.

WNV has been detected in dead bird species of at least 138 species (Center for Disease Control (CDC) 2003, www.cdc.gov.ncidod/dvbid/westnile/birds&mammals.htm). Although birds infected with WNV can die or become ill, most infected birds survive and may subsequently develop immunity to the virus (CDC 2003, www.cdc.gov.ncidod/dvbid/westnile/birds& mammals.htm, Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/Summary2. cfm). In some bird species, particularly corvids (crows, blue jays, ravens, magpies), WNV causes disease (often fatal) in a large percentage of infected birds (Audubon 2003 www.audubon.org /bird/wnv/, CDC 2003 www.cdc.gov.ncidod/dvbid/westnile/birds&mammals.htm, Cornell University 2003, http://environmentalrisk.cornell.edu/WNV/Summary2.cfm, MMWR 2002). In 2002, WNV surveillance/monitoring programs revealed that corvids accounted for 90% of the dead birds reported with crows representing the highest rate of infection (MMWR 2002). Large birds that live and die near humans (*i.e.*, crows) have a greater likelihood of being discovered, therefore the reporting rates tend to be higher for these bird species and are a good "indicator species" for the presence of WNV in a specific area (Cornell University 2003, http://environmentalrisk.cornell. edu/WNV/ Summary2.cfm, Audubon 2003).

According to U.S. Geological Survey (USGS), National Wildlife Health Center (NWHC) (2003, www.nwhc.usgs.gov/research/west nile. html), information is not currently available to know whether or not WNV is having an impact on bird populations in North America. USGS states that it is not unusual for a new disease to cause high rates of infection or death because birds do not have the natural immunity to the infection. Furthermore, it is not known how long it will take

for specific bird population to develop sufficient immunity to the virus.

Surveys of wild birds completed in the last three years have shown that some birds have already acquired antibodies to WNV (USGS-NWHC 2003, www.nwhc.usgs.gov/research/ west_nile.html). Based upon available Christmas Bird Counts and BBS results, USGS-NWHC (2003, www.nwhc.usgs.gov/ research/west _nile.html) states that there have been declines in observations of some local bird populations, however they do not know if the decline can be attributed to WNV or to some other cause. A review of available crow population data by Audubon (2003, www.audubon.org /bird/wnv/) reveals that at least some local crow populations are suffering high WNV related mortality, but crow numbers do not appear to be declining drastically across broad geographic areas. USGS does not anticipate that the commonly seen species, such as crows and blue jays, will be adversely affected by the WNV to the point that these bird species will disappear from the United States (USGS-NWHC 2003, www.nwhc.usgs.gov/research/ west_nile.html). Additionally, any bird found dead or incapacitated could be salvaged by WS personnel and deposited with USFWS, WDNR or health officials, as appropriate, for monitoring purposes.

2.4.7 Lethal Bird Damage Management is Futile because 50-65% of Blackbird and Starling Populations Die Each Year. Because natural mortality in blackbird populations is 50-65% per year, some persons argue that this shows lethal bird damage management is futile (USDA 1997). However, the rate of natural mortality has little or no relationship to the effectiveness of bird damage management because natural mortality generally occurs randomly throughout a population and throughout the course of a year. Natural mortality is too gradual in concentrations of depredating birds to adequately reduce damage. It is apparent that the rate of mortality from bird damage management in Wisconsin is well below the extent of any natural fluctuations in overall annual mortality and is, therefore, inconsequential to regional populations. The resiliency of bird populations does not mean individual bird damage management actions are not successful in reducing damage, but that periodic bird damage management actions are necessary in many damage situations.

2.4.8 Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area. Some individuals might question whether preparing an EA for an area as large as the state of Wisconsin would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing impacts for the entire state may provide a better analysis than multiple EA's covering smaller zones. In addition, Wisconsin WS only conducts bird damage management in a very small area of the State where damage is occurring or likely to occur (see Section 1.5.1).

2.4.9 Cost Effectiveness of Bird Damage Management. Perhaps a better way to state this issue is by the question "Does the value of damage avoided equal or exceed the cost of providing bird damage management?" CEQ does not require a formal, monetized cost-benefit analysis to comply with NEPA (40 CFR 1502.23) and consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. USDA (1997, Appendix L) states:

"Cost effectiveness is not, nor should it be, the primary goal of the APHIS WS program. Additional constraints, such as the environmental protection, land management goals, and others, are considered whenever a request for assistance is received. These constraints increase the cost of the program while not necessarily increasing its effectiveness, yet they are a vital part of the APHIS WS Program."

An analysis of cost-effectiveness in many bird damage management situations is exceedingly difficult or impossible to perform because the value of benefits is not readily determined. For example, the potential benefit of eliminating pigeons from nesting in industrial buildings could reduce incidences of illness among unknown numbers of building users. Since some bird-borne diseases are potentially fatal, or severely debilitating, the value of the benefit may be high. However, no studies of disease problems with and without bird damage management have been conducted, and, therefore, the number of cases *prevented* by effective bird damage management is not possible to estimate. Also, it is rarely possible to conclusively prove that birds are responsible for individual disease cases or outbreaks.

Another example is the management of some wildlife species to protect other wildlife species, such as T/E species. Civil values have been assigned for many common species of wildlife and can be used to calculate their value. In the case of T/E species, their value has been judged "*incalculable*" (*Tennessee Valley Authority vs Hill*, US Supreme Court 1978), making it more difficult to specifically quantify the economic benefit to restore or protect T/E species.

2.4.10 Bird Damage Management Should Be Conducted by Private Nuisance Wildlife Control Agents. Private nuisance wildlife control agents could be contacted to reduce bird damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, they are not required to comply with NEPA, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses, airport managers, and cities and towns may prefer to use WS because of security and safety issues, legal requirements to be accountable to the public through NEPA compliance and reduced administrative burden.

CHAPTER 3: ALTERNATIVES

3.1 INTRODUCTION

This Chapter consists of five parts: 1) introduction, 2) description of alternatives considered and analyzed in detail, including the No Action/Proposed Action (Alternative 1), 3) bird damage management strategies and methods available to WS in Wisconsin, 4) alternatives considered but not analyzed in detail with the rationale, and 5) minimization measures and SOPs for bird damage management techniques. Three alternatives were recognized, developed, analyzed in detail by WS, the USFWS, WDNR, FAA and WDATCP. Four additional alternatives were considered but not analyzed in detail.

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action). The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with the CEQ's (1981) definition.

The current and proposed program is an adaptive integrated Wisconsin WS bird damage management program for the protection of agricultural and natural resources, aquaculture, property, and public health and safety. It is anticipated, based on historical information, that the majority of Wisconsin WS' bird damage management will be at livestock facilities to reduce starling feed consumption and contamination with feces, and reduce potential risk of disease transmission to livestock. Another important function of Wisconsin WS' would also reduce potential aircraft/bird strikes at airports in Wisconsin to reduce human health and safety risks. In addition, other important functions of the Wisconsin WS program would be the protection of property and aquacultural resources. This EA does not include actions that are authorized by the Public Resource Depredation Order[12] (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant impact analysis (Chapter 4 of this EA) to determine any potential affects that may occur from the proposed action.

A major goal of the program is to minimize bird-related losses. To meet this goal, WS would continue to respond to requests for assistance with, at a minimum, technical assistance, or where appropriate when permitted by the USFWS and WDNR and when cooperative funding is available, operational damage management whereby WS personnel conduct bird damage management actions. An IWDM approach would continue to be implemented under this alternative allowing for the use of legally available methods, either singly or in combination, to meet requester needs for reducing bird damage. Agricultural producers, airport managers, property owners and others requesting assistance would be provided information regarding the use of effective non-lethal and lethal techniques, as appropriate. Non-lethal methods include, but are not limited to, lure crops, environmental/habitat/behavior modification, decoy traps and other live traps, exclusionary devices, nest destruction, chemical repellents, and alpha chloralose (AC). Lethal methods considered by WS include: shooting, egg addling/destruction, snap traps, DRC-1339, and American Veterinary Medical Association approved euthanasia techniques, such as CO_2. WS may recommend hunting or DPs to resource owners when these methods are deemed applicable to certain bird damage management situations. Bird damage management would be

[12] This EA only analyzes Wisconsin WS activities to management double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

allowed in the State, when requested, on private or public property where a need has been documented and an *Agreement for Control* or other comparable document has been completed. All management actions would comply with appropriate laws, orders, policies, and regulations.

3.2.2 Alternative 2 – Technical Assistance Only Program. This alternative would not allow for WS operational bird damage management in Wisconsin. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, or others could conduct bird damage management using traps, shooting, Avitrol[13], or any non-lethal method that is legal. Currently, DRC-1339 and AC are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal.

This "*technical assistance only*" alternative would place the immediate burden of operational damage management on State agencies, individuals and requesters. Individuals experiencing bird damage would, independently or with WS recommendations, carry out and fund damage management activities. Individual producers could implement bird damage management as part of the cost of doing business, or a State or other Federal agency could assume a more active role in providing operational damage management assistance.

If Alternative 2 was selected, operational bird damage management would be left to State or other Federal agencies and individuals. Some agencies or individuals may choose not to take action to resolve wildlife damage. Other situations may warrant the use of legally available management methods because of public demands, mandates, or individual preference. Methods and devices could be applied by people with little or no training and experience, and with no professional oversight or monitoring for effectiveness. This in turn could require more effort and cost to achieve the same level of problem resolution, and could cause harm to the environment, including a higher take of non-target animals and illegal use of pesticides could be greater than present.

3.2.3 No WS Bird Damage Management Program.

This alternative would terminate the WS program for bird damage management (operational and technical assistance) on all land classes in Wisconsin. However, State and county agencies, and private individuals could conduct bird damage management but requesters of WS services would not have WS input. WS would not be available to provide technical assistance or make recommendations to livestock producers, airport and landfill managers, property owners or others requesting assistance. In some cases, damage management methods applied by non-WS personnel could be used contrary to their intended or legal use, or more than what is recommended or necessary. In addition, DRC-1339 and AC are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal and Avitrol could be used by any state certified restricted-use pesticide applicator.

A *"no control"* alternative was analyzed by the USFWS (USDI 1979) and was dismissed as an invalid alternative. A *"no control"* alternative was also evaluated in USDA (1997) to which this EA is tiered.

3.3 BIRD DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN WISCONSIN

The strategies and methodologies described below are common to Alternatives 1 and 2. Under Alternative 2, WS personnel would only provide technical assistance recommendations and conduct

13 Avitrol could only be used by state certified pesticide applicators in Wisconsin.

demonstrations. Alternative 3 would terminate both WS technical assistance and operational bird damage management in Wisconsin. The methods used or recommended by WS would be supported by the WS Decision Model (Slate et al. 1992).

3.3.1 Integrated Wildlife Damage Management. The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement effective management methods in a cost-effective[14] manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from an array of options to create a combination of methods for the specific circumstances. IWDM may incorporate cultural practices (*i.e.*, animal husbandry), habitat modification (*i.e.*, exclusion), animal behavior (*i.e.*, scaring), local population reduction, or any combination of these, depending on the characteristics of the specific damage problem. In selecting management techniques for specific damage situations consideration is given to:

- Species responsible
- Magnitude of the damage
- Geographic extent of damage
- Duration and frequency of the damage
- Prevention of future damage
- Presence of non-target species

3.3.2 The IWDM Strategies That WS Employs.

3.3.2.1 Technical Assistance Recommendations. The implementation of damage management actions is the responsibility of the requester, however, WS personnel provide information, demonstrations, and advice on available and appropriate wildlife damage management methods. Technical assistance includes demonstrations on the proper use of management devices (*i.e.*, propane exploders, exclusionary devices, cage traps, etc.) and information on animal husbandry, habitat management, and animal behavior modification that could reduce damage. Technical assistance is generally provided following consultation, or an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and practical application.

3.3.2.2 Operational Damage Management Assistance. This is the conduct or supervision of bird damage management by WS personnel. Operational damage management assistance is initiated when the problem cannot effectively be resolved through technical assistance, and when *Agreements for Control* or other comparable documents provide for WS operational damage management. The initial investigation defines the nature, history, extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or the problem is complex requiring the direct supervision of wildlife professional. WS considers the biology and behavior of the damaging species and other factors. The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, WS, or other agency personnel, as appropriate. Two strategies are available: 1) preventive damage management and 2) corrective damage

[14] The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

management.

3.3.2.2.1 Preventive Damage Management is the practice of applying wildlife damage management strategies before damage occurs, based on historical problems and the probability of the damage recurring or an imminent threat of public health, or disease transmission. As requested and appropriate, WS personnel provide information and conduct demonstrations or take action to prevent historical losses from recurring or reduce the risk of potential losses from occurring. Examples would be applying bird-proof netting over fruit trees before the fruit becomes attractive to birds and the removal of a bird(s) from a food processing plant, restaurant, industrial plant, or a feedlot before the bird(s) has caused damage or threatened public or livestock health, or birds at airports.

3.3.2.2.2 Corrective Damage Management is applying wildlife damage management to stop or reduce current losses. As requested and appropriate, WS personnel provide information and conduct demonstrations, or with the appropriately signed *Agreement for Control* or other comparable document, take action to prevent additional losses. For example, in areas where birds are consuming livestock feed, WS may provide information to the resource owner about exclusionary methods, animal husbandry, mechanical scare devices and pyrotechnics, or conduct operational damage management to reduce losses.

3.3.2.2.3 Educational Efforts. Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, instructional courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

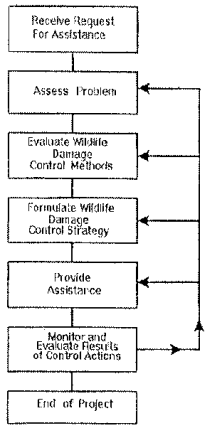
3.3.2.2.4 Research and Development. The National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC research was instrumental in the development of methyl anthranilate (MA) and is currently testing new experimental drugs that inhibit bird reproduction. In addition, NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

3.3.3 WS Decision Making. The WS Decision Making[15] process is a procedure for evaluating and responding to damage complaints (Figure 3-1). WS personnel are frequently

[15] The WS Decision Model is not a written process but a mental problem-solving process common to most, if not all professions to determine appropriate actions to take.

contacted only after requesters have tried non-lethal methods and found them to be inadequate for reducing damage to an acceptable level. WS personnel evaluate the appropriateness of strategies, and methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are developed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results with the damage management strategy.

Figure 3-1. WS Decision Model.



3.3.4 Management of Wildlife Hazards to Aircraft and Air Passengers. WS participates with the FAA under a MOU to provide wildlife damage management information or services, upon request, to airport managers. Sometimes WS evaluates wildlife hazards at airports and then provides Wildlife Hazard Assessments which outline the detected wildlife hazards, and assists airports in developing Wildlife Hazard Management Plans to address wildlife threats. These plans may include specific recommendations to reduce threats associated with a particular wildlife species, including birds. WS also sometimes assists airport managers in obtaining USFWS DPs for the purpose of reducing hazard threats posed by migratory birds. IWDM strategies are employed and recommended for these facilities.

In addition to operational damage management activities consisting of various harassment and lethal removal techniques aimed at potentially injurious wildlife, WS personnel provide ongoing technical advice to airport managers about how to reduce the presence of wildlife in airport environments. WS may also participate in various habitat management projects implemented by airport personnel to provide technical expertise about specific wildlife damage management strategies and methods. In addition, WS promotes improved bird strike record keeping and maintains a program of bird identification and monitoring of bird numbers at participating airports.

WS may receive requests for assistance to resolve wildlife hazards to aircraft and the traveling public in the future from airport managers. WS may provide technical assistance and/or operational assistance using any combination of approved methods discussed in this EA which are appropriate for use in airport environments.

3.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered but not analyzed in detail. These are:

3.4.1 Compensation for Bird Damage Losses.

In Wisconsin, farmers who sustain damage to their agricultural crops caused by Canada geese and wild turkeys are eligible for assistance in preventing/reducing losses and for financial compensation for the losses through the Wisconsin WDACP. To determine goose and turkey damage to crops for this program, each crop field sustaining damage is examined and a thorough on-site damage appraisal is conducted (ss. §§29.889 (7a), Wis. Stats.). This statute was enacted by a legislative act and funded by a surcharge placed on hunting licenses sold in Wisconsin. Because Canada geese and wild turkeys have legal hunting seasons in Wisconsin their damage is covered by the WDACP. Consequently, species without hunting seasons are not covered by the WDACP. Much of WS bird damage work in Wisconsin is preventing damage that may jeopardize human health and safety at airports or livestock health. Compensating diary farmers for losses due to reduced milk yields or animal weight gain would be impossible to accurately determine, and compensation is impractical for risks to human health and safety.

The Compensation Alternative would require the establishment of a system to reimburse persons impacted by bird damage for those species without hunting seasons. This alternative was eliminated from further analysis because no Federal or State laws/policies or regulations exist to authorize such payments for bird damage to resources other than agriculture crops or legally hunted species. Under this alternative, WS would not provide any technical assistance or operational bird damage management to requesters. Aside from the lack of legal authority, analysis of this alternative in USDA (1997) indicates it has many drawbacks, some of these are:

- It would require larger expenditures of money and labor to investigate and validate all losses, and administer appropriate compensation.
- Compensation would most likely be below full market value.
- It would be difficult to make timely responses to all requests.
- Many losses could not be verified, for example, it would be impossible to prove conclusively in some situations that birds were responsible for disease outbreaks.
- Compensation would provide less incentive to limit losses through improved husbandry or cultural practices, or other management strategies.
- Not all entities would rely completely on compensation and lethal damage management would most likely continue as permitted by law.
- Compensation would not be practical for reducing threats to public health and safety.

3.4.2 Bounties.

Bounties are payment of funds for killing birds suspected of causing losses. This alternative is not supported by wildlife and agricultural agencies such WDNR, WDATCP and USFWS. WS does not have the authority to establish a bounty program and does not support this concept because:

- Bounties are generally not effective in reducing damage and it would be difficult to measure overall efficacy.
- Circumstances surrounding the bounty of birds are completely unregulated.
- There is a tendency for fraudulent claims to occur. It is difficult or impossible to prevent claims for birds taken from outside damage management areas.

3.4.3 Short Term Eradication and Long Term Population Suppression.

In Wisconsin, eradication of native bird species is not a desired population management goal of wildlife management agencies including WS. Although generally difficult to achieve, eradication of a local population of pigeons or starlings may be the goal of individual bird damage

management projects. This could, in part, be because pigeons and starlings are not native to North America and are only present because of human introduction. However, eradication as a general strategy for reducing bird damage would not be considered in detail because:

- WS opposes eradication of any native wildlife species.
- WDNR opposes the eradication of native Wisconsin wildlife species.
- Eradication is not acceptable to most members of the public.
- Regional or statewide attempts at eradication of any native bird species would be next to impossible under the restrictions on methods and areas where bird damage management could be used in Wisconsin.

Suppression would direct efforts toward managed reduction of targeted populations or groups of birds. In areas where damage could be attributed to localized populations, WS could decide to implement local population suppression, if supported by the WS Decision Model (Slate et al. 1992) and after consulting with the WDNR and/or USFWS. However, with the constraints on bird damage management methods, widespread population suppression would be difficult to maintain.

Problems with the concept of suppression are similar to those described above for eradication. It is not realistic or practical to consider large-scale population suppression as the basis of the WS program in Wisconsin. Typically, WS activities in the State would be conducted on a very small portion of the sites or areas inhabited or frequented by the targeted species as discussed in Section 1.5.1.

3.4.4 Bird Damage Management Should Be Conducted Using Only Non-lethal Methods. The concept of employing a non-lethal repellent to reduce wildlife depredation arose early in agricultural history and has been pursued vigorously ever since (Rogers 1978). However, a consideration and the measure of success of a non-lethal bird damage management program depends on where target birds relocate because a new site can also be a problem. In addition, most animals adjust and ignore a new sound, a process called habituation (Bomford and O'Brien 1990). Numerous non-lethal techniques have been used to reduce damage caused by many bird species with most having limited success, were labor intensive, impractical, expensive or were not effective in reducing damage (Parkhurst et al. 1987, Dolbeer et al. 1988, Tobin et al. 1988, Bomford 1990, Bomford and O'Brien 1990, Mott and Boyd 1995, Stickley et al. 1995, Andelt and Hopper 1996, Belant et al. 1996, Belant et al. 1998). Some methods, however, had limited success, such as distress calls to repel black-crowned night herons (*Nycticorax nycticorax*) and starlings and changing management practices when the changes allow the enterprise to remain viable (Spanier 1980, Twedt and Glahn 1982, Bomford and O'Brien 1990). Important points when using frightening strategies include the timing of their application and the choice of devices employed. An aggressive and integrated frightening program is essential (Bomford and O'Brien 1990). Playing animal vocalizations to disperse birds during the night, though, can be annoying to people trying to sleep, and could cause other disturbance to domestic animals and wildlife and people. In addition, using sounds based on animal vocalizations must have a certain degree of expertise and motivation to be successful (Bomford and O'Brien 1990).

Many aversive agents have been tested to condition birds to avoid foods, roosts and nest sites. Despite extensive research, the efficacy of these techniques remains unproven or inconsistent (Bomford and O'Brien 1990). In addition, most reported bird repellents are not currently registered by the EPA or WDATCP for this use and, therefore, cannot be legally used or recommended by WS for this purpose.

Limiting bird damage management to only non-lethal methods would not allow for a full range of IWDM techniques to resolve damage management problems. WS is authorized and directed by Congress to protect American agricultural and natural resources, and property. The alternatives selected for detailed analysis in this EA include non-lethal bird damage management methods and it is believed that analysis of only non-lethal methods would not allow WS the ability to address every damage situation in the most effective manner and expediency is required for public health and safety risks.

3.5 MINIMIZATION MEASURES AND STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

Minimization measures and SOPs are features of an action that serve to prevent, reduce, or compensate for unwanted affects that otherwise might result from that action. The current WS program, nationwide and in Wisconsin, uses many such measures and are discussed in detail in Chapter 5 of USDA (1997). The following measures apply to the alternatives in this EA, as indicated in the columns.

Minimization Measures/SOPs	**Alternatives**		
	Current Program	Technical Assistance Only	No WS Program
Animal Welfare and Humaneness of Methods Used by WS			
Research on selectivity and humaneness of management practices would be adopted as appropriate.	X	X	
The WS Decision Model (Slate et al. 1992) would be used to identify effective biological and ecologically sound bird damage management strategies and their impacts.	X	X	
Euthanasia procedures approved by the AVMA would be used for live birds.	X		
The use of newly developed, proven non-lethal methods would be encouraged when appropriate.	X	X	
WS would continue to improve the selectivity and humaneness of management devices.	X	X	
Chemical immobilization/euthanasia procedures that do not cause pain would be used.	X		
All live traps would be maintained with food and water.	X		
Safety Concerns Regarding WS Damage Management Methods			
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate damage management strategies and their impacts, would be used to determine bird damage management strategies.	X	X	
All pesticides used by WS are registered with the EPA and WDATCP.	X		
EPA-approved label directions would be followed.	X		
Most avicides and live traps would be primarily restricted to private lands.	X		

Minimization Measures/SOPs	Alternatives		
	Current Program	Technical Assistance Only	No WS Program
Pesticide use would be by trained and certified personnel.	X		
WS employees, who use pesticides, participate in WDATCP approved continuing education to keep abreast of developments and maintain their certifications.	X		
Live traps would be placed so that captured animals would not be readily visible from any road or public area.	X		
Avicide use, storage, and disposal conforms to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X		
Material Safety Data Sheets for avicides are provided to all WS personnel involved with specific bird damage management activities.	X		
Research is being conducted to: 1) improve bird damage management methods and strategies, 2) increase selectivity for target species, 3) develop effective non-lethal methods, and, 4) evaluate non-target hazards and environmental impacts.	X	X	
Concerns about Impacts of Damage Management on Target Species, T/E Species, Species of Special Concern, and Non-target Species			
WS and the USFWS determined there would be no effect or a not likely to adversely affect to T/E species and would continue to adhere to all applicable measures to ensure protection of T/E species.	X		
Management actions would be directed toward localized populations or groups and/or individual offending birds.	X		
WS personnel are trained and experienced to select the most appropriate methods for removing targeted birds and excluding non-target species.	X		
WS would initiate consultation with the USFWS following any incidental take of T/E species.	X		
WS take of birds would be provided to the USFWS and WDNR for monitoring the potential impacts to bird populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of bird populations (See Chapter 4)	X		
WS consulted with the USFWS regarding the nationwide program and would continue to abide by all applicable measures identified by the USFWS to ensure protection of T/E species.	X	X	

Minimization Measures/SOPs	Alternatives		
	Current Program	Technical Assistance Only	No WS Program
The presence of non-target species are monitored before using avicides at feedlots and dairies to reduce the risk of mortality to non-target species.	X		
If non-target species are present or likely to be present at feedlots or dairies where avicides are being applied, then WS would remain on site to discourage non-target visitation.	X		
WS personnel would contact cooperating agencies to determine peregrine falcon nesting and roosting locations in areas where pigeon damage management is proposed.	X		
If a peregrine falcon is encountered during damage management operations, activities that could adversely affect the falcon would cease until the bird(s) is gone.	X		

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 provides information needed for making informed decisions and in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2 and comparison with the proposed action to determine if the real or potential impacts are greater, lesser, or similar.

4.2 ENVIRONMENTAL CONSEQUENCES

The following resource values in Wisconsin are not expected to be adversely affected by the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, wilderness, and range. These resources will not be analyzed further. In addition, no issues have been identified relative to bird damage management that is inconsistent with EO 12898, 13045, 13112, or 13186 (see Appendix B).

4.2.1 Social and Recreational Concerns. It is not anticipated that the proposed action would result in any adverse cumulative effects to social and recreational resources. Further discussions of WS activities on social and recreational concerns are found in Section 4.3 and USDA (1997).

4.2.2 Wastes (Hazardous and Solid). When bird damage management-treated bait cannot be used or when baits are not totally consumed, the bait is disposed according to label instructions or directions provided by the WDATCP. It is not anticipated that the proposed action would result in any adverse cumulative effects from solid or hazardous wastes.

4.2.3 Target and Non-target Wildlife Species. Cumulative impacts to potentially affected bird species are addressed in detail in Section 4.3.1.

4.2.4 Irreversible and Irretrievable Commitments of Resources. Other than relatively minor uses of fuels for motor vehicles and electricity for office operations, no irreversible or irretrievable commitments of resources result from the Wisconsin WS program. Based on these estimates, the Wisconsin WS program produces negligible impacts on the supply of fossil fuels and electrical energy.

4.2.5 Cumulative and Unavoidable Impacts. Cumulative and unavoidable impacts of each alternative to bird and non-target populations are discussed and analyzed in this chapter (Section 4.3.1 and 4.3.2) and effects from this management plan are discussed in relationship to bird species/groups. This EA recognizes that the total annual removal[16] of birds by all causes is the cumulative mortality. Cumulative impacts would be mortality caused by Wisconsin WS bird damage management and other known causes of mortality (USDA 1997). It is not anticipated that the proposed action would result in any adverse cumulative effects to bird/wildlife populations, including T/E species.

Estimating wildlife densities is not precise and populations and habitats are often dynamic, therefore, professional judgment is required to account for unknowns and variables. Some of the variables include things such as the ability of habitats to support populations of animals, habitat

16 It is recognized that the other mortality of wildlife (i.e., road kills, disease, natural mortality, etc.) occurs throughout Wisconsin but no reliable system exists for recording this information.

variability effects on population stability, predation and recruitment. In addition, wildlife populations can change considerably from one year to the next due to factors such as drought, food shortages or disease. Therefore, adverse effects assessments are based on conservative estimates and trends to better ensure that no unwanted adverse wildlife population impacts would occur.

Analysis of Wisconsin WS' bird *"take,"* combined with other possible mortality, indicates that cumulative annual impacts would not be significant, and through close cooperation and consultation with the USFWS and WDNR would not be expected to adversely affect bird populations. The Wisconsin WS program is not expected to have any adverse cumulative effects on non-target wildlife or their habitats, including T/E species. Furthermore, bird damage management, as implemented by WS, would not jeopardize public health and safety.

4.2.6 Evaluation of Significance

Each major issue is evaluated under each alternative and the direct, indirect and cumulative impacts were analyzed. NEPA regulations describe the elements that determine whether or not an impact is *"significant."* Significance is dependent upon the context and intensity of the action. The following factors were used to evaluate the significance of impacts in this EA that relate to context and intensity (adapted from USDA 1997) for this proposal:

4.2.6.1 Magnitude of the Impact (size, number, or relative amount of impact) (intensity). The "*Magnitude*" analysis for the alternatives analyzed in this EA follows the process described in USDA (1997:Table 4-2). Magnitude is defined in USDA (1997) as *". . . a measure of the number of animals killed in relation to their abundance."* Magnitude may be determined either quantitatively or qualitatively. Qualitative analysis is based on population trends and harvest data or trends and modeling. "*Other Harvest*" includes the known sport harvest, and other information obtained from the WDNR and USFWS. "*Total Harvest*" is the sum of the Wisconsin WS kill combined with the "*Other Harvest.*"

4.2.6.2 Duration and Frequency of the Action. Duration and frequency of bird damage management in Wisconsin is highly variable. Abiotic and biotic factors affecting bird behavior will affect the duration and frequency of bird damage management activities conducted by WS in Wisconsin. Bird damage management at airports may be long duration projects but the frequency of individual operational bird damage management projects may be highly variable depending upon spatial, temporal, and biotic factors affecting the behavior of the birds that are causing damage. For instance, the removal of several birds that continue to loaf near runways may be very infrequent if non-lethal techniques prevent additional birds from habituating to the area. Projects involving starling damage management at diaries will generally be short in duration but may happen frequently at different sites.

4.2.6.3 Likelihood of the Impact. Bird damage management in Wisconsin will have a low magnitude of impact on overall populations as compared to natural mortality factors that these populations experience. Because all wildlife populations may experience compensatory and additive mortalities year round, the effect of WS bird damage management will generally not result in adverse effects to populations.

4.2.6.4 Geographic Extent. Bird damage management could occur anywhere in Wisconsin where damage management has been requested, agreements for such actions

are in place and action is warranted, as determined by implementing the WS Decision Model (Slate et al. 1992). Actions would generally be limited to areas receiving damage by birds, areas with historical bird damage, or areas where a threat of damage exists.

4.3 ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of the issues analyzed in detail using the current program as the baseline for comparison with the other alternatives to determine if the real or potential impacts are greater, lesser or the same (Table 4-4). Four key potential issues of this program have been identified, and each of these issues is analyzed for each alternative. The four issues are:

- Cumulative Effects of WS Bird Damage Management on Target Species Populations
- Effects of WS Bird Damage Management on Non-target Species Populations, Including T/E Species
- Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets
- Efficacy of WS Bird Damage Management Methods.

4.3.1 Cumulative Effects of WS Bird Damage Management on Target Species Populations.

Analysis of this issue is limited primarily to those species most often removed during WS bird damage management, or that could be intentionally dispersed during bird damage management activities. Generally, WS conducts damage management on species whose population densities are high (*e.g.*, overabundant or anthropogenic abundant (Conover 2002)) and/or invasive species and only after they have caused damage or an identified potential damage risk exists. The analysis for magnitude of impact on these species' populations generally follows the process described in USDA (1997 Chapter 4).

Many bird species that WS conducts activities are protected by the USFWS under the MBTA. Therefore, those species (all except starlings, house sparrows, and pigeons) are taken in accordance with applicable State and Federal laws and regulations authorizing take of migratory birds, and their nests and eggs, including the USFWS and the WDNR permitting processes[17]. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of specific populations. This should assure that cumulative impacts on species protected under the MBTA would have no significant adverse impact on the quality of the human environment and long-term viability of the population.

The target species were selected because Wisconsin WS has received requests for assistance with these species and they could be taken or deterred to protect agricultural and natural resources, property and people from injury or damage (*i.e.*, bird damage management at airports to reduce or prevent risks to the traveling public from bird strikes to aircraft). In addition, other target species could be killed or have nests removed by Wisconsin WS. This provision is allowed under Section G of WS' MBTA permit MB042886-3, which allows WS to take, capture/relocate or remove nests and eggs of birds posing an immediate threat to human health and safety or were the health of the bird is jeopardized.

17 It is entirely possible that an urgent need or emergency, such as threats to the traveling public could require that action be taken prior to reaching a decision. None of the planners and decision makers involved in this effort is precluded from considering comments filed in this process at any time (even after actions to deal with the threat have begun) and making appropriate adjustments to ongoing program operations.

4.3.1.1 Alternative 1 – Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

Alternative 1 would continue the current Wisconsin WS bird damage management program which, based on historical information, is primarily bird damage management at livestock facilities to reduce starling feed consumption and contamination with feces, and reduce potential risk of disease transmission to livestock. Another function of Wisconsin WS' is to reduce potential aircraft/bird strikes at airports in Wisconsin to reduce human health and safety risks. In addition, the Wisconsin WS program would protect property and aquacultural resources. This EA does not include actions that are authorized by the Public Resource Depredation Order[18] (50 CFR 21.48). However, population dynamics information was used in the double-crested cormorant impact analysis of this EA to determine any potential affects that may occur from the proposed action.

As stated earlier, additional agreements may be signed by WS in the foreseeable future to assist landowners/managers with bird damage problems, however these additional agreements are not anticipated to significantly increase WS activities or the adverse effects to bird species populations. The majority of bird species targeted by WS are migratory and range from northern to southern latitudes during the year. This analysis focuses on Wisconsin and regional population data using BBS population trend data (see Section 4.3.1.1.1). The BBS is a national survey that annually gathers data during the nesting season, primarily in June, regarding breeding birds. The survey consists of about 3700 routes across the U.S. and Canada. The USFWS Region 3 is used because the boundaries of these geographical units are based on ecological differences making regions more meaningful in terms of migratory birds.

Non-lethal Damage Management Activities.

Preference is given to non-lethal damage management when practical and effective (WS Directive 2.101). Wisconsin WS dispersed about 6,710, birds of at least 19 species (*i.e.,* crows, mourning dove, ring-billed gulls, red-tailed hawks, great blue herons, American kestrels, killdeer, mallards, eastern meadow larks, great-horned owls, feral pigeons, upland sandpipers (*Bartramia longicauda*), various shorebirds, starlings, barn swallows, and turkey vultures) in FY02 and 4,343 birds of at least 23 species in FY03, using non-chemical harassment methods such as propane exploders and pyrotechnics. One advantage of dispersing birds would be that relatively no cumulative impacts occur. However, there would be the possibility that the birds could return to the damage site and inflict additional damages or move to another site and continue to cause damage. Normally, large scale relocation activities are limited to wild and feral/domestic waterfowl in and around urban areas. Live capture and relocation is not normally practical for smaller birds such as starlings, pigeons, etc. because of: 1) the number of birds WS confronts annually, 2) potential public safety and health issues (*i.e.,* capturing birds at an airport where they were involved with aircraft hazards and relocating those birds to another area where they could return to an airport and continue to be a safety hazard to aircraft), 3) competition for food resources and other limiting factors with other birds and wildlife, 4) the difficulty in finding acceptable release sites, 5) costs of relocation would increase because of the great distance it requires to relocate birds if trying to prevent them from returning to the original site, and 6) relocated birds could create the same disease transmission potential to people or livestock in the relocation area.

Lethal Damage Management Activities.

18 This EA only analyzes Wisconsin WS activities to management double-crested cormorant damage at private and public aquaculture facilities. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order.

Lethal damage management is implemented when a bird damage management problem cannot be resolved effectively through non-lethal damage management and where *Agreements for Control* or other comparable documents provide for operational damage management. Table 4-1 provides information on the number of birds Wisconsin WS killed by method during in FY00, 01, 02 and 03.

USFWS Depredation Permits.

DPs are necessary under the MBTA and BGEPA for activities related to migratory bird damage management. DPs are not necessary for non-lethal harassment of species protected only under MBTA, but a Section 7 consultation and permit could be required for WS to conduct damage management on migratory birds listed under the ESA. Additionally, any *"take"* of a T/E listed species (which could be protected under MBTA, BGEPA and the ESA) could require multiple permits.

Table 4-1. Target Birds Killed by WS* during FY 00, 01, 02 and 03.

FY	Species	Damage Management Method			
		Trap	Shot	DCR1339	Non-chemical Other
00	None taken				
01	None taken				
02	Herring gulls		1		
	Ring-billed gull		6		
	Mallard		13		
	Pigeon		1		
	Starling		10	7,931[1]	
03	Red-winged Blackbird		11		
	Mourning Dove		18		
	Herring Gull		12		
	Ring-bill Gulls		39		
	Great blue heron		4		
	Killdeer		5		3
	Mallards		48		
	Pigeons		871	25	
	Starlings		10	4,606[2]	

* WS' data is summarized and reported on a FY basis.

[1] 7,931 starlings were retrieved, however, bait distribution and consumption could have killed up to 18,289 starlings.

[2] 4,616 starlings were retrieved, however, bait distribution and consumption could have killed up to 28,386 starlings.

The USFWS has authority for managing migratory birds and issuance of DPs (50 CFR 21.41) to persons who clearly show evidence of migratory birds causing or about to cause damage. In Wisconsin, DPs issued by the USFWS are sent to the WDNR for review. If the WDNR concurs with the issuance of the DP they will consign the permit and forward to the permittee. In addition, for State listed T/E bird species, WS will consult with the WDNR Avian Ecologists for affects from WS activities to these species.

WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds as specified in an MOU with the USFWS and in a cooperative agreement with the WDNR, and when funding allows. In cases where intermittent damage is occurring and it is not feasible or practical for WS to provide operational assistance, WS could recommend to the USFWS the issuance of a DP to the resource owner (WS Directive 2.301). Table 4-2 provides information on the number of requests for assistance WS received in FY00, 01, 02 and 03 for bird damage management, the number of DPs WS recommended and forwarded to the USFWS, and Table 4-3 provides take under those permits.

The issuance of DPs for WS activities has evolved over the past several years. Litigation against

the USFWS resulted in a 1997 Department of Justice (DOJ) opinion that permits were not necessary under MBTA and BGEPA for Federal agencies. Litigation against WS in Virginia resulted in a 1999 stipulation that WS would request, and USFWS would issue, MBTA permits, the previous DOJ opinion notwithstanding. USFWS notified WS on November 7, 2001 that a 1982 Solicitors opinion which held that prohibitions in the BGEPA did not apply to Federal employees had been rescinded.

WS conducted a Section 7 consultation with the USFWS under ESA to insure no adverse effects to T/E species, and is required to obtain MBTA and ESA permits for activities which may *"take"* species protected under the respective acts. Guidelines for issuance of permits have been developed and implemented by the USFWS. WS and the USFWS believe the analysis contained in this EA will address the environmental consequences for the USFWS to issue DPs and for WS to receive and implement depredation/scientific collection permits.

Table 4-2. Requests for Assistance and DP Recommended by WS during FY 00, 01, 02 and 03.

FY	Resource Protected	Requests	DPs Recommended
00	Agriculture	748	51
	Health & Safety	226	25
	Natural Resources	33	5
	Property	720	60
01	Agriculture	360	40
	Health & Safety	199	31
	Natural Resources	51	9
	Property	370	52
02	Agriculture	692	50
	Health & Safety	3,435	43
	Natural Resources	32	10
	Property	812	55
03	Agriculture	714	56
	Health & Safety	1,593	64
	Natural Resources	77	10
	Property	631	56

It should be noted that starlings, house sparrows and pigeons are considered non-indigenous, invasive species, and because of their negative impacts and competition with native birds, are considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. These three species are not protected by MBTA or state law. Any reduction in starling, house sparrow or pigeon populations in North America, even to the extent of complete eradication, could be considered beneficial to native bird species. Additionally, blackbird and crow populations are healthy enough, and the problems they cause great enough, that the USFWS has established a "standing depredation order" (50 CFR 21.43) for use by the public. Under the "standing depredation order" (50 CFR 21.43) no Federal permit is required by anyone to remove these birds if they *are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, aquaculture, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*. Additionally, under NR §§12.05(2) the State of Wisconsin has determined that a State permit is not required of any person to shoot or trap cowbirds, crows, grackles, house sparrows, starlings, and red-winged blackbirds when found committing or about to commit depredations upon agricultural crops, livestock, ornamental or shade trees or when constituting a health hazard or other nuisance. Further, the USFWS also established a Public Resource Depredation Order (50 CFR 21.48) for double-crested cormorants because their populations are healthy enough, and the problems they cause great enough to warrant this order. Under this "standing depredation order" (50 CFR 21.48) agencies that have been charged with management of the natural resources may choose to reduce damages caused by double-crested cormorants to protect the public's interest. All of the above information indicates that populations of the above

listed birds are healthy and viable.

4.3.1.1.1 WS, at Times, Conducts Lethal Bird Damage Management on the Species Below.

Many bird population trends are best monitored by using data from the BBS[19]. The BBS is a large-scale inventory of North American birds coordinated by the USGS Patuxent Wildlife Research Center (Sauer et al 2004). The BBS is a combined set of more than 3,500 roadside survey routes primarily covering the continental United States and southern Canada.

Table 4-3. DPs Issued by the USFWS and Bird Take Under DPs* in Wisconsin.

Species	FY01		FY02		FY03	
	Issued	Take	Issued	Take	Issued	Take
American Kestrel	0	0	2	0	2	0
Barn Swallow	2	0	4	0	3	0
Belted Kingfisher	13	70	14	70	14	72
Blue-winged Teal	1	0	1	0	1	0
Cliff Swallow	3	10	6	28	5	0
Common Grackle	1	0	1	0	1	0
Double-crested Cormorant	4	7	6	2	9	6
Great-blue Heron	22	108	28	136	29	137
Great-horned Owl	3	2	3	0	6	4
Green-backed Heron	3	13	5	18	7	21
Gulls	28	281	32	465	41	476
Killdeer	2	0	3	3	5	8
Mallard	6	5	6	12	6	70
Mourning Dove	3	0	5	1	5	23
Red-tailed Hawk	2	0	7	1	8	6
Sandhill Crane	1	4	3	4	8	12
Turkey Vulture	0	0	1	0	2	0
Woodpeckers	5	4	16	4	18	4

* USFWS data is summarized and reported on a calendar year.

The BBS was started in 1966, and routes are surveyed in June by experienced birders. The stated primary objective of the BBS has been to generate an estimate of population change for songbirds. Populations of birds tend to fluctuate, especially locally, as a result of variable annual local habitat and climatic conditions. Trends can be determined using different population equations, and statistically tested to determine if a trend is significant. The significance of a trend's "change" is reflected in the calculated *P*-value (probability) for that species.

To use the BBS, though, a few assumptions need to be accepted:

- All birds within a ¼ mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a ¼ mile in radius at all stops due to obstructions such as hills, trees, and brush and because some bird species are elusive. Therefore, the birds seen per route would provide a conservative estimate of the population. In Wisconsin, the detectability of birds would vary based on terrain and cover.

- The chosen survey routes are totally random and are fully representative of Wisconsin habitats. However, when BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a ½ mile apart. Therefore, if survey areas had stops with excellent food availability, such as a landfill site or waterfowl

19 Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty.

nesting habitat where birds may congregate, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated.

- Birds are equally distributed throughout the survey area (*i.e.*, Wisconsin, Eastern Region or USFWS Region 3) and routes were randomly selected. However, routes are randomly picked throughout the State/areas, but are placed on the nearest available road. The starting point is picked for accessibility by vehicle. Some birds tend to congregate along roadsides and others avoid roadside areas. However, most BBS routes are selected because they are "off the beaten path" so the observer can hear birds without interruption from vehicular noise.

WS recognizes the statistical variability of the data and believes that the BBS represents the best available commercial and scientific data available to evaluate bird populations and population trends. Trend data reported for all species below reflect apparent trends in reported data. WS has not independently evaluated statistical significance in trend data. Because bird damage management is generally directed at individual birds or local populations of overabundant/ anthropogenic abundant (Conover 2002) species, the statistical significance of population trends over a large area are only marginally related to local populations where bird damage management occurs.

Starling and Blackbird Biology and Population Impacts.

Starlings were introduced into North America in 1890-91 when about 80 pair were released into New York City's Central Park (Bump and Robbins 1966). In just 100 years, starlings have colonized the United States and expanded into Canada and Mexico and have become one of the most common birds in North America (Feare 1984).

Precise counts of starling and blackbirds do not exist, but one estimate placed the Unites States summer population at more than one billion (USDA 1997) and the winter population at 500 million birds (Royall 1977). Meanley and Royall (1976) estimated 538 million blackbirds and starlings in winter roosts across the country during the winter of 1974-75. Of this total about 74% or about 400 million were in the eastern United States (Meanly and Royall 1976).

The nationwide starling population has been estimated at 140 million (Johnson and Glahn 1994) and Meanly and Royall (1976) report that the 1974-75 winter starling population in the eastern States was estimated at about 112 million birds. The estimated natural mortality of starlings is about 50%. Based on the 1974-75 wintering population estimate, about 56 million starlings die annually in the eastern States and about 70 million starlings die annually to natural mortality nationally (Meanly and Royall 1976). An extensive population survey by Dolbeer and Stehn (1983) showed that in the northwestern United States, the number of breeding starlings tripled between 1968 and 1981.

Data from Packham (1965) suggests that an average of 57 starlings were killed per pound of DRC-1339 treated bait used at feedlots. In addition, research studies and field observations suggest DRC-1339 treatments kill about 75% of the starlings at cattle feeding facilities (Besser et al. 1967). Based on the amount of bait distributed by Wisconsin WS, this would have resulted in a starling and blackbird take of 0 (FY00), 0 (FY01), 18,289 (FY02), and 28,386 (FY03). However, WS could take up to 200,000 starlings for the protection of livestock feed and health, and to protect the public from disease threats or aircraft strikes if program expansion occurs. BBS data (Sauer et al. 2004) indicate starling breeding populations have slightly decreased in Wisconsin from 1966-2003 and are relatively stable in USFWS Region 3. This information, plus

the fact that an estimated 70 million starlings die of natural causes indicates that the impact from Wisconsin WS starling damage management is of the low magnitude.

WS did not intentionally kill any red-winged blackbirds during FY00 to FY02, however, WS killed 11in FY 03 to protect people and aircraft on airports. Red-winged blackbird population trends from 1966 to 2003 show that the population is relatively stable to slightly decreasing in Wisconsin and USFWS Region 3 (Sauer et al. 2004). WS did not kill any Brewer's blackbirds in FY02 or 03. Population trends for Brewer's blackbird from 1966 to 2003 in Wisconsin show a stable population trend in Wisconsin and slightly increasing in USFWS Region 3 (Sauer et al. 2004). During this same time period (FY00 to 03) WS did not kill any brown-headed blackbirds and population trends are decreasing in Wisconsin (Sauer et al. 2004). Additionally, WS did not kill any common grackles during FY00 through FY03 and populations appear to be stable to slightly decreasing in Wisconsin and relatively stable in the USFWS Region 3 (Sauer et al. 2004). Since Wisconsin WS only targeted 11 red-winged blackbirds and has not targeted or baited any Brewer's blackbirds, brown-headed cowbirds or common grackles there would be very minimal to no cumulative effects from WS bird damage management activities. However, it is possible that some of these species could be present and unidentifiable in flocks of starlings where Wisconsin WS conducts bird damage management at feedlots and dairies, or at airports. Because of this possibility, Wisconsin WS could potentially take up to 1,000 of each of these species. Based on this information, WS has determined that bird damage management would likely have minimal cumulative effects to populations of these blackbirds based on apparent breeding bird population trends as described by Sauer et al. (2004), and their reproductive potential and natural mortality (see Section 2.4.4). Therefore, removal of damaging blackbirds would have a low magnitude of impact. Additionally, blackbird populations are healthy enough, and the problems they cause great enough that the USFWS has established a standing depredation order for use by the public. Under this "Order" (50 CFR 21.43), no Federal permit is required by anyone to remove blackbirds if they *are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance*. All of the above information indicates that populations of starlings and blackbirds are healthy and viable in Wisconsin, USFWS Region 3 and nationwide.

Wild Turkey Biology and Population Impacts

Turkeys have been introduced and are now fairly common locally in open wooded areas or forest clearings. The eastern wild turkey is the most widely distributed, abundant and hunted turkey subspecies of the five distinct subspecies found in the United States. It inhabits roughly the eastern half of the country. The eastern wild turkey is found in the hardwood and mixed forests from New England and southern Canada to northern Florida and west to Texas, Missouri, Iowa and Minnesota. It has also been successfully transplanted in states outside of its original range including California, Oregon and Washington.

Since the eastern wild turkey ranges the farthest north, individuals can also grow to be among the largest of any of the subspecies. The adult male, called a gobbler or tom, may measure up to 4 feet tall at maturity and weigh more than 20 pounds. A mature female, called a hen, may be nearly as tall but is usually lighter, weighing between 8 and 12 pounds. Males have their upper tail coverts, which cover the base of the long tail feathers tipped with chestnut brown and tail tips with dark buff or chocolate brown. In contrast, the breast feathers are tipped in black. Other body feathers are characterized by rich, metallic, copper/bronze iridescence. Females are similar in color to the males but more brown, and the metallic reflections are less brilliant. Feathers of the hen's breast, flanks and sides are tipped with brown rather than the black and white tips of the male (National Wild Turkey Federation, www.nwtf.org).

They are considered weak fliers and are non-migratory; their food is acorns, fruit and seeds. Turkeys are a game species in Wisconsin and has a regulated hunting season with about 50,196 turkeys killed during the 2002 hunting seasons (WDNR 2003) and 55,524 turkeys killed during the 2003 hunting seasons (Dhuey and Warnke 2004a, Dhuey and Warnke 2004b).

Wisconsin WS did not kill any wild turkeys during FY00 through FY03 and Wisconsin BBS population trend data (Sauer et al. 2004) indicate that wild turkey populations are dramatically increasing in Wisconsin. The WDNR estimates the 2004 turkey population at approximately 400,000 birds (B. Woodbury, WDNR, 2004 pers. comm.). Based on an anticipated increase in requests for services, WS' lethal management of wild turkeys for airport safety or other resource protection reasons could remove up to 20 birds in any one year without adversely affecting their population. WS activities have resulted and would continue to result in a low magnitude of impact given the fact that more than 50,000 turkeys were killed by sport hunters in Wisconsin in 2002 and 2003 and the turkeys removed by WS would not be available to sports hunters (*i.e.*, turkeys at airport properties).

Feral, Domestic Pigeon Biology and Population Impacts.

Pigeons, also known as rock doves, are an introduced non-native species to North America and are not protected by law. Any lethal Wisconsin WS bird damage management would likely be restricted to sites where pigeons are causing damage, or are considered a health threat or nuisance, and reduction or removal of a local population could be attempted. This action would be considered beneficial since it would reduce disease threats and property damage/defacing.

No pigeons were killed by WS in Wisconsin during FY00 and FY01; however, in FY02 one pigeon was killed by shooting and in FY03 WS shot 871 pigeons (Table 4-1) and used 26 grams of DRC-1339 to reduce property damages and to address human health and safety concerns. Based on the calculations for DRC-1339 use, WS may have killed up to 1,000 pigeons with DRC-1339.

Wisconsin BBS population trend data (Sauer et al. 2004) indicate that pigeon populations are increasing in Wisconsin and relatively stable in USFWS Region 3. The impact of Wisconsin WS current bird damage management program is not having an adverse effect on pigeon populations in Wisconsin or in USFWS Region 3. However, WS could take up to 5,000 pigeons for the protection of the public from disease threats or aircraft strikes (*i.e.*, human health and safety) and property protection from defacing without adversely affecting populations. Because pigeon populations are increasing in Wisconsin, are not protected under MBTA, and are an invasive species, WS or any other sources of mortality could be considered beneficial to native species and a low magnitude of impact.

Wild Mallard Biology and Population Impacts.

The mallard is the world's most familiar duck (Gooders and Boyer 1986) and is the most adaptable, occupying a wide range of habitats. Clutch sizes vary from 10-12 eggs and incubation takes about 28 days. One of the mallard's foraging characteristics is its ability to utilize agricultural grain crops as well as natural aquatic foods (Johnsgard 1975).

The past declines of mallard populations is not fully understood, however, most waterfowl biologists agree that recurring drought conditions in nesting areas in Canada are an important factor. Duck production depends upon water conditions and when water is abundant, production is good and poor production is expected when water is scarce. Other factors that may influence mallard population trends are predation, limited nesting habitat, liberal hunting regulations, and

harvesting females. During the 2002 regulated waterfowl hunting season, sport hunters killed 226,000 mallards in Wisconsin (http://migratorybirds.fws.gov/reports/reports.html). In 2003 the WDNR estimated that there were 276,000 mallards nesting in Wisconsin (Lehner et al. 2003). The BBS population trend data from 1966 to 2003 shows the mallard population is increasing in Wisconsin and USFWS Region 3 (Sauer et al. 2004).

Non-lethal methods were used in FY03 to move or disperse 106 mallards and WS removed 48 mallards by shooting to protect human health and safety. In FY00 through FY 03, WS received 156 requests for bird damage management technical assistance from the public and natural resource agencies to help reduce mallard damage. After a damage assessments was conducted, WS recommended that six, six, and six DPs be issued/renewed by the USFWS for airport and human health and safety concerns in FY 01, 02and 03, respectively.

Based on an anticipated increase in requests for services, WS' lethal removal of up to 500 mallards, both wild and domesticated, in any one year for airport safety and protection of other resources would not adversely affect mallard populations. Because mallard populations appear healthy in Wisconsin and USFWS Region 3, sport hunters killed 226,000 mallards in Wisconsin in 2002 and because of USFWS DP requirements, WS actions would result in a low magnitude of impact and have low impacts to hunting opportunities.

Mourning Dove Biology and Population Impacts

Mourning doves are migratory bird with substantial populations throughout much of North America and are the most common native dove found in suburban and farmland areas and is the most widely hunted and harvested game bird. This dove, found across the United States and southern Canada, is most common throughout the Great Plains in the Midwest. Mourning doves are one of Wisconsin's most widespread breeding bird species. They can be found on telephone wires and trees in most neighborhoods in the southern half of the state and in conifer plantations between late March and late September or early October. They are capable of multiple brooding and their range is expanding northward (Ehrlich et al. 1988). After its prolonged breeding season, most congregate in large flocks particularly around agricultural fields (Walsh et al. 1999). They are seed eating birds and many states have regulated annual hunting seasons for this species, including Wisconsin, and take is liberal.

WS did not disperse any mourning doves during FY00 through FY03, however, did killed 18 mourning doves at airport facilities in FY 03 to reduce the risk of bird/aircraft strikes (Table 4-1) and the USFWS reported that 23 mourning doves were killed under DP's (Table 4-3). Mourning doves are considered a game species with a regulated hunting season with reported take of 632,000 in 2001-2002 in Illinois alone (http://migratorybirds.fws.gov/reports/status03 /2003%20Dove%20Report.pdf). Wisconsin instituted their first hunting season during 2003, however harvest data is not available for Wisconsin at the present.

Mourning dove breeding populations appear to be high and increasing in Wisconsin and high and relatively stable in USFWS Region 3 (Sauer et al. 2004). In addition, the USFWS estimated that 4,000,000 to 5,000,000 mourning doves migrate from Wisconsin annually (Dolton and Rau 2004). Based on an anticipated increase in requests for services, WS' lethal management of mourning dove in Wisconsin could remove up to 100 damaging or potentially damaging birds in any one year without adversely affecting populations. In addition, WS activities would result in a low magnitude of impact and have low impacts to hunting opportunities.

Killdeer Biology and Population Impacts

Killdeer occur over much of North America and a fraction of South America; from the Gulf of Alaska coastline the range extends southward throughout the United States and reaches the Atlantic and Pacific coasts (Hayman et. al. 1986). Killdeer are technically in the family of shorebirds, they are unusual shorebirds in that they often nest and live far from water. Killdeer are commonly found in a variety of open areas, even concrete or asphalt parking lots at shopping malls, as well as fields and beaches, ponds, lakes, road-side ditches, mudflats, airports, pastures, and gravel roads and levees but are seldom seen in large flocks. Killdeer appear in the Midwest in about February. It's also one of the last migrants to leave in the fall, remaining into November.

Distinguishing characteristics include a dark, double banded breast, with the top band completely encircling the upper body/breast. Another band is located at the head, resembling a mask absent of the facial portion. The band is continuous, thinning while going across the face along the forehead region and above the bill, and thickening at the supercilium; extending around the eye and onward around the back of the head. Plumage is relatively absent of complexity with the exception of a vividly colored, reddish-orange rump that is visible during flight and behavioral displays. The rest the body consists of a grayish-brown coloration along the dorsal side, crown and nape, while the ventral region is white. Sex characteristics are difficult to determine since killdeer are essentially monomorphic. The clutch of up to four eggs is laid in a ground scrape in open habitats (Leck 1984).

WS activities with killdeer could primarily occur on airports to reduce bird/aircraft strike hazards. WS killed eight killdeer during FY03 at airport facilities to reduce the risk of bird/aircraft strikes (Table 4-1) and the USFWS reported that three killdeer were killed in 2002 and eight in 2003 under a DP (Table 4-3). BBS population trend data indicate that killdeer populations in Wisconsin are fairly stable and the USFWS Region 3 populations have increased during 1966 to 2003 (Sauer et al. 2004).

Based on an anticipated increase in requests for services, WS' lethal removal of killdeer in Wisconsin could remove up to 50 damaging or potentially damaging birds in any one year without adversely affecting populations. Based on the above information, USFWS oversight, and WS limited lethal take of killdeer in Wisconsin, WS would have a low magnitude of impact on local, statewide, or regional killdeer populations.

Gulls

During most of the last several decades, several gull species (*i.e.*, ring-billed, herring, and great black-backed gulls) have expanded their range and increased their populations substantially within the Great Lakes (Scharf and Shugart 1998). The number of ring-billed and herring gulls breeding and residing in the Great Lakes region of the United States have increased dramatically during the past couple of decades (Blokpoel and Tessier 1991, Cutbert and McKearnan 1998). Cutbert and McKearnan (1998) report that between 1977 and 1997-99 herring gull breeding pairs increased from 29,000 to 35,000 pairs and nesting colonies expanded from 190 to 290. They also reported that between 1976-77 and 1989-91 ring-billed gull breeding pairs increased from 102,000 to 284,000 and the 1997-1999 estimates increased to 309,000. The nesting population of herring gulls on Sandusky Bay, Laske Erie, Ohio increased at an average annual rate of 11.9% from 1976 through 1989 (Dolbeer et al. 1990).

In addition to increases in gull populations in natural habitats, there has been an increase in populations in urban areas where gulls have established colonies on buildings (Dolbeer et al. 1990). Dwyer et al. (1996) documented 7,922 pairs of roof-nesting gulls at 30 colonies in four Great Lakes states, including Ohio with 17 colonies and Wisconsin with 8 colonies. The growth

in these populations has been dramatic, for example, in Cuyahoga County, Ohio, there were three roof-nesting colonies with 265 pairs in 1990 and more that 2,549 breeding pairs in 13 colonies in 1994 (Dwyer et al. 1996).

Ring-billed Gull Biology and Population Impacts.

Ring-billed gulls appearance is similar to California and herring gulls but they are smaller, have yellow feet, and a yellow bill with a black band near the tip. Ring-billed gulls are a common gull in Wisconsin and populations are concentrated near lakes, reservoirs, and other large bodies of water. Like most gulls, ring-billed gulls are omnivorous, feeding on animal and plant matter. Common feeding sites are open refuse dumps, livestock feedlots, fish hatcheries, open fields and food processing plants. Spring arrival of migrants in Wisconsin begins in March/April and autumn migration is normally completed in October, however, some ring-billed gulls may remain longer.

WS removed six ringed-bill gulls in FY02 and 39 gulls in FY03 by shooting to protect human health and safety at airports (Table 4-1). WS responded to 37 requests for assistance in FY00, 31 in FY01, 111 in FY02 and 138 in FY03 to reduce ring-billed gull damage. After investigating complaints, WS recommended that the USFWS issue or renew 41 DPs in 2003 (Table 4-3). In addition, the USFWS reported that 281, 465, and 476 gulls of all species were killed under DP in 2001, 2002, and 2003, respectively (Table 4-3).

BBS population trend data indicate that ring-billed gulls in Wisconsin and the USFWS Region 3 have increased from 1966 to 2003 (Sauer et al. 2004). Because ring-billed gull population trend data indicate that populations are increasing and an increase in requests for assistance, WS could remove up to 2,000 damaging or potentially damaging gulls without adversely affecting populations. Based on the above information, USFWS oversight, this level of take by WS in Wisconsin would have a low magnitude of impact on local, statewide, or regional ring-billed gull populations.

Herring Gull Biology and Population Impacts.

The herring gull is not common to Wisconsin, but possibly seen during their migration in early spring and back during autumn (Robbins et al. 1997). It is the largest of the five species of gulls that could occur in Wisconsin with the body length of about 20 inches and wing span of about 55 inches. Most distinctive adult characteristics are a red dot on the lower bill and pinkish legs and feet. The herring gull can be found near garbage dumps and near lakes and rivers.

During FY 00 through 03, Wisconsin WS killed one herring gull in FY02 and 13 gulls in FY03 to protect resources and human health and safety (Table 4-1). In addition, WS responded to seven requests for assistance in FY00, 37 in FY01, 48 in FY02 and 70 in FY03 to reduce herring gull damage. After investigating complaints, WS recommended that the USFWS issue or renew 28, 32, 41 gull DPs (Table 4-3). In addition, the USFWS reported that 281, 465, and 476 gulls of all species were killed under DP in 2001, 2002, and 2003, respectively (Table 4-3).

Herring gull BBS population trend data for the USFW Region 3 indicate that herring gull populations have been decreasing from 1966 to 2003 (Sauer et al. 2004). However, because herring gulls could occur on airport facilities and cause risk to the traveling public and aircraft from bird strikes and damage other resources such as moored boats at marinas, WS could remove up to 1,000 damaging or potentially damaging herring gulls without adversely affecting populations. Based on the above information, USFWS oversight, this level of take by WS in

Wisconsin would have a low magnitude of impact on local, statewide, or regional herring gull populations.

Great Blue Heron Biology and Population Impacts.

One of the tallest birds in Wisconsin, the great blue heron stands about 38 inches tall and has a wing span of about 70 inches (Robbins et al. 1997). Great blue herons are the most widely distributed heron in the United States and are commonly seen in Wisconsin during the spring, summer, and autumn. Herons feed on fish and other aquatic vertebrates and are commonly viewed standing or wading on the shores of ponds, creeks, and rivers. The head of the heron is largely white with dark under parts and the body is primarily bluish in color.

During FY 03 WS shot four great blue herons to reduce risks to aircraft (Table 4-1) and provided technical assistance 11 times in FY00, 44 in FY01, 53 in FY02 and 56 in FY03 to reduce great blue heron damage. In addition, the USFWS issued 22, 28, and 29 DPs in 2001, 2002 and 2003, respectively (Table 4-3).

BBS population trend data for Wisconsin indicate that great blue heron populations are decreasing to stable and USFWS Region 3 population trends indicate that great blue heron populations are increasing (Sauer et al. 2004) and out of a total of 101 BBS regions, great blue heron population trends have increased. Because great blue heron populations appear to be stable to increasing and with USFWS oversight provided, WS could take up to 20 great blue herons to protect human health and safety at airports or remove birds that are depredating nursery fish stocks without adversely affecting populations. This level of take by WS in Wisconsin would have a low magnitude of impact on local, statewide, or regional great blue heron populations.

Feral, Domestic and Exotic Birds Biology and Population Impacts.

WS is requested to provide bird damage management for losses or nuisances created by feral, free-ranging, domestic, non-indigenous, and exotic birds (WS Directive 2.320). The terms "feral" and "free-ranging" relate to domestic animals which have permanently escaped confinement or have been released into the wild, rural areas, city parks, etc. Feral and free-ranging birds are not necessarily dependent upon people for food or care. A domestic duck, commonly found on farms and inter-urban lakes and ponds, is a product of the domestication of the mallard, a larger bird than generally found in truly wild populations. Examples of other domestic or domestic hybrid birds include, muscovy ducks, peacocks, golden pheasants, monk parakeets, etc. "Domestic" refers to animals which are generally animals such as chickens, turkeys, guinea fowl, racing pigeons, domestic ducks and geese, ostriches, emus, etc. and have escaped temporarily from their confinements or owners and are still totally dependent on people for food and care. "Exotic" and "non-indigenous" refers to animals not native to Wisconsin which have been illegally or accidentally introduced or released in the wild.

Birds classified or termed feral, free-ranging, domestic, and exotic are not considered wildlife and are not afforded lawful protection or managed by the USFWS or WDNR. Therefore, no populations or population trend data exist.

In Wisconsin, WS uses a combination of methods to distinguish feral ducks (unprotected) from wild ducks (protected under MBTA). Feral ducks are distinguished by feather coloration not typical of wild ducks (*i.e.*, all white, a combination of white and other colors in a random pattern (*i.e.*, mottled) or very dark plumage on hens), weight (ducks in excess of 3¾ lbs (1.7 kg) during most of the year or 4½ lbs (2.0 kg) from November through January are considered feral) and/or flight ability (*i.e.*, many domestic ducks cannot fly or fly very poorly). Flight ability alone is not

used as a determining condition during the summer molt. Most feral ducks exhibit two or more of these characteristics. Feral ducks, when captured, are euthanized while wild ducks may be released to the wild in accordance with permit guidance from the USFWS.

Where practical, WS will use non-lethal methods for feral, domestic and exotic birds, including adoption of captured birds to the public when appropriate. Any lethal bird damage management by WS would be restricted to individual sites. In those cases where birds are causing damage or are a nuisance, complete removal of the local population could be desired. This would be considered beneficial to the human environment since it would be requested by the affected property owner, administrator, or resource management agency.

During FY 00 through 03, WS did not capture nor kill any exotic or feral birds, however provided technical assistance five times in FY00, four times in FY01, four times in FY02 and six times in FY03 for exotic or feral bird damage reduction. However, because of the status of these birds, lethal removal would not be considered to have an adverse affect on native species and of a low magnitude of impact.

4.3.1.1.2 WS Did Not Conduct Lethal Bird Damage Management on the Species Below, but did Provide Technical Assistance or Non-lethal Operational Bird Damage Management.

Even though WS did not provide any lethal bird damage management to reduce damage from the species below, occasions could arise whereby lethal bird damage management would be required to reduce damages to acceptable levels or reduce health and safety risks or threats.

House Sparrow Biology and Population Impacts.

House sparrows or English sparrows were introduced to North America from England in 1850 and have spread throughout the continent (Fitzwater 1994). The species is not protected by Federal or State laws. Like starlings and pigeons, because of their negative impacts and competition with native bird species, house sparrows are considered by many wildlife biologists, ornithologists and naturalists to be an undesirable component of North American native ecosystems. House sparrows are found in nearly every habitat except dense forest, alpine, and desert environments. It prefers human-altered habitats, and is abundant on farms, in cities and suburbs (Robbins et al. 1997).

During FY00, WS responded to 34 requests for assistance with house sparrow complaints, 21 in FY01, 245 in FY02 and 47 in FY03, but did not kill any house sparrows (Table 4-1) and because they are not afforded protection by the MBTA, DP's are not required before they can be killed by the public. BBS population trends from 1966-2003 show that house sparrows are and have been decreasing in Wisconsin and USFWS Region 3 (Sauer et al. 2004).

Any bird damage management involving lethal damage management by WS would probably be restricted to individual sites. Any reduction in house sparrow populations, even to the extent of complete eradication at these sites, could be considered beneficial on populations of native bird species since house sparrows are considered an invasive species.

Belted Kingfisher Biology and Population Impact.

The belted kingfisher is the most common kingfisher in North America and the only one north of Texas and Arizona. It is generally seen singly or in pairs along streams and ponds. They dive headlong from the air into water to catch fish often hovering overhead before diving.

During FY00, WS responded to four requests for assistance with kingfisher complaints, 14 in FY01, 18 in FY02 and 17 in FY03, but did not kill any kingfishers (Table 4-1). In addition, the USFWS issued 13, 14, and 14 DPs in 2001, 2002, and 2003, respectively (Table 4-3). WS has not killed any kingfishers; however, because the Wisconsin WS program may expand to protect human health and safety (*i.e.*, aircraft bird strikes) and aquaculture, it could be expected that WS may remove up to 10 kingfishers to protect resources.

BBS population trend data from 1966 to 2003 indicate that belted kingfisher populations are relatively stable to slightly decreasing in Wisconsin and in USFWS Region 3 (Sauer et al. 2004). Because of USFWS oversight and population levels, the potential take by WS to protect human health and safety and aquaculture in Wisconsin would have a low magnitude of impact on local, statewide, or regional belted kingfisher populations.

Mute Swan Biology and Population Impacts[20]

The mute swan was introduced from Europe into the United States in the late 19th century near New York City. Feral breeding took place after 544 more individuals were introduced in the lower Hudson Valley in 1910 and on Long Island in 1912. In the eastern United States, scattered breeding now occurs from Massachusetts to Virginia (Master 1992). Feral populations became established over time as swans that had escaped or been intentionally released from captivity survived and reproduced in the wild. Mute swans prefer freshwater ponds and streams of 10 acres or less and coastal bays and salt marshes. The swan's diet consists mostly of rooted aquatic vegetation. Small islands, narrow peninsulas, and clumps of aquatic vegetation are preferred nesting sites. Nesting territories vary in size from 4 to 10 acres and are used year-around or reoccupied each year. The mute swan lays the largest of all swan eggs, and a typical clutch of four to eight eggs takes 35 to 38 days to hatch.

Since 1986, the Atlantic Flyway population of feral mute swans has grown 118%, from 5,800 birds to over 12,600 swans. This growth is seen throughout the Flyway, especially in the Chesapeake Bay region (Maryland and Virginia) which has increased 1271.3% (Atlantic Flyway Council 2000). This rapid growth rate in the Chesapeake Bay shows the potential growth rate that this invasive species could have throughout the Flyway. The upper Mid-Atlantic States of New York, New Jersey, and Pennsylvania had a combined mute swan growth rate of 62.4%, with New Jersey showing an increase of 157.8% (Atlantic Flyway Council 2000). This same trend is seen in the Mississippi Flyway and in Wisconsin where the mute swan population is increasing and estimated to be about 250 to 300 birds. BBS trend data from 1966-2003 indicate that mute swan populations have steadily increased in the Great Lakes area and in USFWS Region3 (Sauer et al. 2004). During FY00, WS responded to 0 requests for assistance with mute swan complaints, 3 in FY01, 5 in FY02 and 3 in FY03, but did not kill any mute swans (Table 4-1). In addition, during FY 03 WS recommended that one DP be renewed by the USFWS (Table 4-2).

Mute swans are protected by the USFWS under the MBTA and the take is limited by permit. Therefore, mute swans are only taken in accordance with applicable state and Federal laws and regulations authorizing take of migratory birds, or their nests and eggs. This would assure that cumulative impacts on mute swan populations would have no significant adverse impact on the quality of the human environment. The number of swans authorized to be taken under USFWS-issued permits will be guided by a Final EIS completed by the USFWS on mute swan management. During FY03, the USFWS issued a DP to WS to take up to 25 mute swans to

20 However, due to a court injunction in FY03, the USFWS rescinded all DPs to take mute swans. Therefore, no action will be taken to remove mute swans until the USFWS completes their final rule making process.

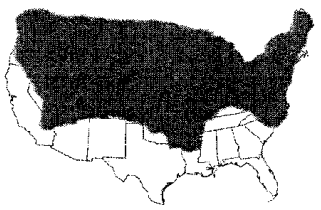
protect natural resources and human health and safety. However, due to a court injunction in FY03, the USFWS rescinded all DPs to take mute swans. Therefore, no action will be taken to remove mute swans until the USFWS completes their final rule making process.

Based upon an anticipated increase in requests for services and resolution of the court injunction, WS' lethal management of up to 25 mute swans in any one year to protect human health and safety and property would not adversely affect populations. Based on the above information, USFWS oversight, and WS limited lethal take of mute swans in Wisconsin, WS would have a low magnitude of impact on local, statewide, regional or continental mute swan populations.

Blue-winged Teal Biology and Population Impacts

Blue-winged teal are small shy ducks of ponds, marshes and protected bays (Robbins et al. 1997). They breed from southeastern Alaska and western Canada to Canadian Maritimes and south to northeastern California, New Mexico, and New York (Figure 4-1). They winter from southern California, southern Texas, and Carolinas southward through tropical America. They arrive latest of all ducks at their breeding grounds and leave early in the fall. On low, marshy prairies in the central part of the continent, where blue-winged teal are most numerous, virtually every pond and pothole has a breeding pair. The male commonly "*stands guard*" on the pond while the female is incubating eggs. They are usually one of the first birds to migrate with many states opening an early hunting season for this duck. It is one of the faster flying ducks and since they are so small they appear to fly even faster. Both sexes have a light blue area on the forward edge of the wing, and a green speculum. During periods which males have breeding plumage they have a distinct white facial crescent.

Figure 4-1. Summer Breeding Areas for Blue-winged Teal.



During the 2002 regulated waterfowl hunting season, sport hunters killed 41,000 blue-winged teal in Wisconsin (http://migratorybirds.fws.gov/reports/reports.html). The BBS population trend data from 1966 to 2003 shows that breeding populations of blue-winged teal have slightly decreased in Wisconsin and in USFWS Region 3 (Sauer et al. 2004).

WS did not conduct any non-lethal management during FY00-03 to move or disperse blue-winged teal. In FY00-03, WS received three requests for assistance in FY02 and two in FY03 for bird damage management technical assistance from the public and natural resource agencies to help reduce blue-winged teal damage or potential damage. After on-site damage assessments were conducted, the USFWS issued one DP to reduce damage (Table 4-3). Because the Wisconsin WS program is anticipated to expand to protect human health and safety, up to 50 blue-winged teal could be removed without adversely affecting populations. If WS received a request to conduct lethal damage management of blue-winged teal and a need was established, WS would consult with USFWS and WDNR. Because of this consultation, and that 41,000 birds were sport harvested in 2002 in Wisconsin and 451,000 were harvested in the Mississippi Flyway, WS activities would result in a low magnitude of impact and have low impacts to hunting opportunities.

Woodpecker Biology and Population Information

Woodpeckers have a strong bill, sharply pointed for chipping and digging into tree trunks or branches for wood-boring insects, but also chisel holes into structures, presumably for nesting cavities (Robbins et al. 1997). They use their stiff tail as a prop to aid in chiseling. In addition,

most species "*drum*" on resonant limbs, poles, drainpipes, or other structures. Flight is usually undulating, with wings folded against the body after each series of flaps. Woodpeckers chisel a cavity into a tree branch or trunk, or structure to nest. Woodpecker damage to structures is the primary reason for people requesting WS assistance.

During 2001 through 2003, the USFWS issued 5, 16, and 18 DPs to resolve property damage problems with woodpeckers in 2001, 2002, and 2003, respectively (Table 4-3). WS has not killed any woodpeckers, however, because the Wisconsin WS program may be expanding, WS may remove up to 20 woodpeckers of the below species under a DP issued by the USFWS.

Northern Flicker Biology and Population Impacts.

Flickers have black spots on a tanish-white breast and belly and are about 11 inches in length. Males have a black or red "mustache" extending from the gape of the beak to below the eyes. In summer, flickers are distributed from Alaska to the southern regions of the United States (Short 1982) and migrate to Mexico and the southern United States during winter. The habitats of the flicker are diverse, from shrub deserts and tree-bordered streams of the Great Plains to everglade hammocks, city parks, mountain fir forests, and farm pastures.

Flickers' diet consist of ants, termites, beetles, crickets, aphids, caterpillars, including their eggs, pupae, and larvae, and other insects obtained from trees and the ground (Short 1982). Vegetation such as berries and other fruits make up a large part of the diet in the autumn and winter. The nesting season in Wisconsin begins in April/May. Males claim territories and attract females by "*drumming*," vocalizing, wing flicking, and other displays. Nests are constructed in cavities of dead trees, buildings, fence posts, telephone poles, etc.

During FY00 through 03, Wisconsin WS did not remove any flickers to protect resources and did not disperse any flickers using non-lethal techniques, but received two requests for assistance in FY00, none in FY01, three in FY02 and three in FY03 (Table 4-2). In addition the USFWS issued 5, 16 and 18 DPs to resolve woodpecker problems in Wisconsin in 2001, 2002 and 2003, respectively (Table 4-3).

The BBS trend data (Sauer et al. 2004) indicate that breeding flicker populations are decreasing in Wisconsin and in USFWS Region 3. WS did not remove any northern flicker during FY00 through FY03; however, WS may receive requests for assistance in the future and could remove damaging flickers. As a result, under a DP issued by the USFWS, WS may remove up to 20 damaging flickers and this effect on northern flicker populations would result in a low magnitude of impact.

Hairy Woodpecker Biology and Population Impact.

Hairy woodpeckers are common in Wisconsin and found in suburban areas, parklands, orchards and in forests. They have white vertical stripes on their back and are considered a medium sized bird and are larger than the similar downy woodpecker (Robbins et al. 1997); hairy woodpeckers are between 9 and 13 inches in length.

Hairy woodpecker populations appear to be stable or increasing across most of the United States, however, they have become rare and localized in Florida and adjacent Georgia, where it continues to decline. In this region, they are found strictly in mature pine forests and strongly prefer recently burned areas. Natural wildfires play a vital ecological role in the southeastern United States, and fire suppression by humans has made many species--including the hairy woodpecker--become threatened in this region (www.birds.cornell.edu/BOW/HAWP/). In addition, these birds

suffer when they have to compete with house sparrows and European starlings for nest cavities (www.wbu.com/ chipperwoods/photos/hwood.htm).

During FY 00 through 03, Wisconsin WS did not remove any hairy woodpeckers to protect resources and did not disperse any hairy woodpeckers using non-lethal techniques, but received 18 requests for assistance in FY00, 44 in FY01, 68 in FY02, and 46 in FY03. After on-site investigations and damage assessments, Wisconsin WS recommended that 14 DPs be issued/renewed by the USFWS in FY03. The USFWS issued 5, 16 and 18 DPs to resolve woodpecker problems in Wisconsin in 2001, 2002 and 2003, respectively (Table 4-3).

The BBS trend data (Sauer et al. 2004) indicate that breeding hairy woodpecker populations are stable to slightly increasing in Wisconsin and in USFWS Region 3. WS did not remove or disperse any hairy woodpeckers during FY 00 through FY03; however, WS may receive requests for assistance and could remove damaging hairy woodpeckers. As a result, under a DP issued by the USFWS, WS may remove up to 20 damaging hairy woodpeckers and this effect would result in a low magnitude of impact on hairy woodpecker populations.

Downy Woodpecker Biology and Population Impact.

The downy woodpecker is the most common North American woodpecker, and also the woodpecker reported most frequently by Project FeederWatch participants (www.birdsource.org/gbbc/birdid/dowp/). During the 1996-1997 Project FeederWatch season, more than 69% of the participants reported downy woodpeckers, making them the fourth most common Project FeederWatch bird. They are seen in suburbs, orchards, shade trees, and wooded areas. They appear similar to hairy woodpeckers, only smaller; the downy woodpecker is approximately 6.5 inches in length. Downy woodpeckers have plumage that is a sharply contrasting pattern of blacks and whites. The downy woodpecker breeds over a widespread area encompassing most of North America, except for the extreme southwestern United States and areas below tree line.

During FY 00 through 03, Wisconsin WS did not remove any downy woodpeckers to protect resources and did not disperse any downy woodpeckers using non-lethal techniques, but received 46 requests for assistance in FY00, 67 in FY01, 61 in FY02 and 47 in FY03. However, after on-site investigations and damage assessments, Wisconsin WS recommended that 14 DPs be issued by the USFWS in FY03. The USFWS issued 5, 16 and 18 DPs to resolve woodpecker problems in Wisconsin in 2001, 2002 and 2003, respectively (Table 4-3).

The BBS trend data (Sauer et al. 2004) indicate that breeding downy woodpecker populations are stable to slightly increasing in Wisconsin and in USFWS Region 3. WS did not remove any downy woodpeckers during FY 00 through FY03; however, WS may receive requests for assistance and could remove damaging downy woodpeckers. As a result and under a DP issued by the USFWS, WS may remove up to 20 damaging downy woodpeckers and this affect would result in a low magnitude of impact on downy woodpecker populations.

Pileated Woodpecker Biology and Population Impact.

The pileated woodpecker lives in Canada from British Columbia east to Nova Scotia. It can be found in most areas of the eastern United States. It is found in the west from Washington south to California and east to Idaho and North Dakota (www.nhptv.org/natureworks/pileatedwoodpecker .htm). Pileated woodpeckers are uncommon and a wary bird generally in extensive deciduous or mixed forests (Robbins et al. 1997). The pileated woodpecker is about 15 inches in length and is one of the largest woodpeckers found in North America. It has a black body, a red crest, and

white stripes on its neck. The solid black back distinguishes it from other large birds except crows and some hawks; however it has the conspicuous crest.

During FY 00 through 03, Wisconsin WS did not remove any pileated woodpeckers to protect resources and did not disperse any pileated woodpeckers using non-lethal techniques, but received six requests for assistance in FY00, ten in FY01, nine in FY02 and three in FY03. After on-site investigations and damage assessments, Wisconsin WS recommended that two DPs be issued/renewed by the USFWS. The USFWS issued 5, 16 and 18 DPs to resolve woodpecker problems in Wisconsin in 2001, 2002 and 2003, respectively (Table 4-3).

The BBS trend data (Sauer et al. 2004) indicate that breeding pileated woodpecker populations are increasing in Wisconsin and in USFWS Region 3. WS did not remove any pileated woodpeckers during FY00 through FY03; however, WS may receive requests for assistance in the future and could remove damaging pileated woodpeckers. As a result and under a DP issued by the USFWS, WS may remove up to 20 damaging pileated woodpeckers and this affect would result in a low magnitude of impact on pileated woodpecker populations.

Other Woodpecker Species and Population Impact.

In addition to the above mentioned woodpeckers, WS receives requests for information or assistance for unidentified woodpecker species. During FY00 through FY03, WS received 130, 62, 47, and 29 requests, respectively, for information or assistance for unidentified woodpeckers. These requests mainly consist of information for either hairy or downy woodpeckers that cannot be identified by the complainant. In addition, some of these species may include red-headed woodpeckers (*Melanerpes erythrocephalus*) and red-bellied woodpeckers (*Centurus carolinus*). WS anticipates that the annual take of these species will not exceed more than several individuals. BBS data from 1966 to 2003 indicate that red-headed woodpecker populations are decreasing in Wisconsin but red-headed woodpecker populations are increasing and both populations are healthy (Sauer et al. 2004). Therefore, WS take of individuals of these species to protect building structures will have a low magnitude of impact, and take will only occur under a DP issued by the USFWS.

Swallow Biology and Population Impact.

Barn Swallow - Barn swallows are common near farms, bridges and other buildings, where they build mud nests on building rafters, bridges, or other vertical structures. BBS data indicate that barn swallow population trends in Wisconsin are relatively stable and relatively stable in the USFWS Region 3 (Sauer et al. 2004).

Cliff Swallows - Cliff swallows are also common in Wisconsin. These swallows soar more than other swallows and can be distinguished by its orange rump, square tail, broad martin-like wings and buffy forehead. Cliff swallows are also colony nesters and build nests under eaves or bridges. BBS data indicate that cliff swallow population trends in Wisconsin are relatively stable and increasing in USFWS Region 3 (Sauer et al. 2004).

During FY 00 through 03, WS did not kill any swallows, but responded to 13 requests for assistance in FY00, 34 in FY01, 27 in FY02, and 41 in FY03 to protect property and human health and safety and the USFWS issues two, four and three DPs for problems in Wisconsin 2001, 2002, and 2003, respectively (Table 4-3). Since swallow population trends appear to be relatively stable to increasing in Wisconsin and USFWS Region 3, WS could remove under a DP issued by the USFWS up to 50 barn and 50 cliff damaging swallows per year without adversely affecting populations. These activities will have a low magnitude of impact on barn and cliff

swallow populations.

American Crow Biology and Population Impacts.

American crows are distributed north to south from the Yukon Territory, Canada, to Baja, California and Gulf of Mexico, and are found from the west coast to the east coast (Johnston 1961). American crows can be found throughout the year in Wisconsin. From their spring nesting colonies, or autumn and winter roosts, they forage for insects, grain, and carrion. Johnston (1961) reports that crows reach their peak abundance in agricultural areas where there are wooded areas, and have increased in numbers where agricultural practices have increased.

According to the BBS population trend results, crow populations in Wisconsin and in the USFWS Region 3 have increased from 1966 to 2003 (Sauer et al. 2004). In addition, crow populations are healthy enough, and the problems they cause great enough, that the USFWS has established a standing depredation order for use by the public. Under this "order" (50 CFR 21.43), no Federal permit is required by anyone to remove crows if they are *committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance.*

During FY00 through 03, WS did not use lethal bird damage management to reduce damage caused by crows. During FY00, WS received 74 requests for assistance, 53 in FY01, 1,923 in FY02 and 503 in FY03 (Table 4-2). If damage occurs or if crows present a threat at airport facilities to the traveling public or aircraft from aircraft strikes, WS could remove (under CFR 21.43) or disperse 100 crows with no magnitude of impact on crow populations from WS' activities.

Turkey Vulture Biology and Population Impacts.

This species breeds from Canada to southern South America, adapting equally well to deserts, eastern deciduous forests, and tropical lowlands (Wilbur 1983). Adult turkey vultures are black in color with a bright-red, naked head (Robbins et al. 1997), while immature vultures have black heads. Turkey vultures migrate to Wisconsin during April, nest, and return to their winter range in about September. Turkey vultures nest in caves, hollow trees, thickets, or old buildings (Jackson 1983, Ritter 1983). Usually two eggs are laid during nesting but as many as four eggs have been documented (Jackson 1983).

Turkey vultures are carrion feeders, eating fresh meat or carrion in advanced stages of decay, and will readily feed on mammal and bird carcasses of various sizes. In search of food, vultures soar in circle-type patterns. When food is located by a single bird, other birds are quickly attracted to the site by behavior cues exhibited by the feeding bird.

Local vulture populations have been known to increase and decline (Wilbur 1983) which suggests that food availability could be a limiting factor. A major range expansion into the northeastern United States began after 1920, possibly caused by a decline in bison carrion in the west and an increase of white-tailed deer populations and other road-killed animals.

The BBS population trend data from 1966 to 2003 indicates the turkey vulture breeding population has increased in Wisconsin and also populations are increasing in USFWS Region 3 (Sauer et al. 2004).

During FY 00 through 03, WS did not kill any turkey vultures, but responded to four requests for assistance in FY00, four in FY01, 12 in FY02, and seven in FY03 for protection of agricultural

resources, property and human health and safety (*i.e.*, reduce risks to aircraft). WS recommended two DPs be renewed by the USFWS for turkey vulture damage problems in FY03 (Table 4-3). Since turkey vulture population trends appear to be increasing in Wisconsin and in the USFWS Region 3, WS could take up to 10 turkey vultures per year under a DP issued by the USFWS to protect human health and safety, property and agricultural resources without adversely affecting populations. Based upon the low level of anticipated take and the increasing turkey vulture population, WS activities would have a low magnitude of impact.

Greater Sandhill Crane Biology and Population Impacts.

The greater sandhill crane is the largest of six subspecies of sandhill cranes and is common to Wisconsin during spring, summer, and autumn. About 30,000 greater sandhill cranes breed in Wisconsin, Michigan, Ontario, and neighboring states. In late summer and early fall, these birds begin to congregate in preparation for fall migration. Sandhill cranes from Wisconsin migrate to Indiana where they remain for several weeks before completing their migration to Florida and Georgia. They are one of the first migratory birds back to Wisconsin, often arriving in late February or early March (http://www.savingcranes.org/species/sandhill.asp).

Greater sandhill crane adults stand about 37 inches high and have a wing span of about 80 inches (Robbins et al. 1997). Adult bird coloration is gray with a red crown. Juvenile bird coloration is brownish and they lack the red crown. Adult males are larger than females and weigh about 12 and 9 pounds, respectively. Greater sandhill's breeding habitats in the eastern United States consist of meadows, willow-dotted streams, shallow marshes, and other associated wetland habitats (Johnsgard 1983).

Foraging behaviors of sandhill cranes vary by season and area and they adjust their diets to local resources. However, corn and other small grains are the most important food items during spring migration and an important aspect of crane survival in winter and spring (Johnsgard 1983). Other food items consist of invertebrates (worms, grasshoppers, grubs, etc.) and various forms of vegetation. Sandhill cranes forage primarily on land and do much digging with their bills when necessary to extract food items from the soil (Johnsgard 1983).

Data from the Midwest Sandhill Crane Count indicate that the sandhill crane population is still increasing. In 1999, more than 1,800 volunteers counted more than 11,000 sandhill cranes in Wisconsin and portions of neighboring states (http://www.savingcranes.org/species/sandhill.asp). BBS population trends for Wisconsin and the USFWS Region 3 show that greater sandhill crane populations have increased sharply from 1966 to 2003 (Sauer et al. 2004). However, the sandhill crane population growth has slowed in central Wisconsin, possibly because few nesting territories remain vacant. The largest annual increase (about 20% per year) is in the counties along Wisconsin's borders where nesting territories are still available in suitable habitat.

Wisconsin WS has not used lethal means during FY00 through FY03 to reduce sandhill crane damage (Table 4-1), or dispersed any sandhill cranes with non-lethal techniques. During FY00 through FY03, WS received 180, 37, 79, and 74 requests, respectively, from individuals who reported sandhill crane damage to either agricultural, human health and safety or property resources. The USFWS issued one, three, and eight DP to resolve sandhill crane damage in Wisconsin in 2001, 2002, and 2003, respectively (Table 4-3). Based on these requests and under a DP issued by the USFWS, WS could remove up to 30 sandhill cranes to protect various resources. Because the sandhill crane population are increasing and appear healthy in Wisconsin and USFWS Region 3, WS' actions would result in a low magnitude of impact to sandhill crane populations.

Double-crested Cormorant Biology and Population Impacts.

The double-crested cormorant is one of six species of cormorants breeding in North America and has the widest range (Hatch 1995). They range throughout North America, from the Atlantic coast to the Pacific coast. They are also a long-lived bird. From 1990 to 1997, the overall growth rate in the Interior region was estimated at 6% (Tyson et al. 1999) with the most dramatic increases occurring on Ontario, Michigan, and Wisconsin waters (Wires et al. 2001). From 1970 to 1991, the Great Lakes breeding population alone increased from 89 nests to more than 38,000 nests, an average annual increase of 29% (Weseloh et al. 1995). From 1991 to 1997, the number of nests in the Great Lakes further increased to approximately 93,000, an average annual increase of 22%. Nest counts in 2000 estimated 115,000 nests in the Great Lakes (Weseloh et al. 2002). The total estimated number of nesting pairs in the Interior population (including Canada) is 256,212 (Tyson et al. 1999).

Data from the BBS (1966-2003) shows that the double-crested cormorant populations throughout the United States and the Eastern BBS region have increased at an annual rate of 8.0% and 8.7%, respectively (Sauer et al. 2004). The Wisconsin population trend indicates that cormorants have steadily increased from 1966 to 2003 and also in USFWS Region 3 (Sauer et al. 2004). In addition, the USFWS predicts that authorized take of cormorants and their eggs for the management of double-crested cormorant damage, including those taken in Wisconsin, is anticipated to have no significant impact on regional double-crested cormorant populations (USFWS 2003b).

The USFWS published in the Federal Register on October 8, 2003 their final rule and notice of record of decision adopting a Public Resource Depredation Order (50 CFR 21.48) based upon analysis of this alternative and other alternatives in their final EIS addressing cormorant management in the United States. The Public Resource Depredation Order allows people to take cormorants when they are in the act or about to commit depredations to fish, wildlife, plants, and their habitats. The final rule identifies 24 states (including Wisconsin) which may implement provisions of the public resource depredation order. Wisconsin WS will conduct additional NEPA analysis to address double-crested cormorant management activities under the Public Resource Depredation Order. This EA only addresses double-crested cormorant management activities that would be conducted at private or public aquaculture facilities.

Wisconsin WS has not used lethal means to reduce cormorant damage to aquaculture, nor have non-lethal methods been used to move or disperse cormorants from areas experiencing damage. WS responded to 1 request for assistance in FY00, 7 in FY01, 19 in FY02, and 15 in FY03 to primarily protect aquaculture facilities and fish from cormorant predation and WS recommended that ten DPs be renewed by the USFWS for cormorant damage problems in FY03. The USFWS issued four, six and nine DPs in Wisconsin to resolve damage in 2001, 2002, and 2003, respectively (Table4-3). Based upon the above information, Wisconsin WS anticipates that requests for assistance in the future to reduce cormorant damage could result in the removal of up to 100 cormorants annually which would be insignificant to the overall viability and reproductive success of this species population on a local, regional, and nationwide scale and a low magnitude of impact.

Raptors.

Raptors are a large, worldwide family of diurnal birds of prey (*i.e.*, flesh eaters) equipped with strong, curved talons for capturing and killing live prey and heavy, sharp, hooked bills to cut and tear flesh for consumption. In most species the sexes appear alike; however the males are smaller

than the females. In addition, there is much individual variation in coloration, and several species have dark forms.

Great Horned Owl Biology and Population Impacts.

The great-horned owl is common in Wisconsin and throughout the United States and the largest owl in North America. The great-horned owl's color pattern is similar to long-eared owls, however, great horned owl "*ear tufts*" are larger and farther apart; their bellies are finely barred horizontally. They are found in woods, mountain forests, desert canyons, marshes, city parks, and urban forests. The owls prefer open areas to dense woodlands or nest sites close to the edge of a forest where they can hunt. Great-horned owls commonly occupy the abandoned nests of large birds, nests in tree cavities, stumps, in caves or on rocky ledges.

Great horned owls are one of the earliest spring nesting birds; eggs may be laid in January or February through April. They lay from one to three eggs but typically two eggs are laid. The young fledge from the nest at 45-55 days old. They can live more than 12 years and some captive birds have lived to 29 years old.

During FY 00 through 03, WS did not kill any great-horned owls (Table 4-1) but did receive seven requests for assistance in FY00, 17 in FY01, 14 in FY02 and 20 in FY03 for great-horned owl damage management assistance to protect agriculture (*e.g.*, poultry). In addition, the USFWS issued three, three and six DP to resolve problems in Wisconsin in 2001, 2002, and 2003, respectively (Table 4-3).

BBS population trends for Wisconsin indicate that great-horned owl populations have slightly increased and remained relatively stable in USFWS Region 3 (Sauer et al. 2004). Because great-horned owl populations are healthy and relatively stable in Wisconsin and USFWS Region 3, removal of up to ten great-horned owls causing damage by WS annually under a DP issued by the USFWS would result in a low magnitude of impact.

Red-tailed Hawk Biology and Population Impacts.

Red-tailed hawks are a well-known and common buteo. They range throughout North America to central Alaska and northern Canada, and south as far as Panama. Although not truly migratory, they do adjust seasonally to areas with abundant prey. In winter many of the northern birds move south. They nest in woodlands and feed on rodents and rabbits in open country. The uniformly colored tails of the adult and dark belly band are the best field marks, however, they show a great deal of individual variation in plumage. They often perch on poles or treetops to hunt. The red-tailed hawk is the largest hawk, usually weighing between 2 and 4 pounds. As with most raptors, the female is nearly $^{1}/_{3}$ larger than the male and may have a wing span of 56 inches.

BBS population trends indicate that red-tailed hawk populations have steadily increased in Wisconsin and in USFWS Region 3 (Sauer et al. 2004). During FY 00 through 03, WS did not kill any red-tailed hawks (Table 4-1). However, WS did receive 29 requests for assistance in FY00, 24 in FY01, 55 in FY02 and 39 in FY03 for damage management assistance to protect poultry and human health and safety. The USFWS issued two, seven and eight DP in Wisconsin to resolve problems in 2001, 2002, and 2003, respectively (Table 4-3). Because red-tailed hawk populations appear healthy, and are increasing in Wisconsin and USFWS Region 3, removal of up to 20 red-tailed hawks causing damage or potentially causing damage (*i.e.*, bird aircraft strikes) annually under a DP issued by the USFWS would result in a low magnitude of impact.

Cooper's Hawk Biology and Population impacts.

The Cooper's Hawk is a strictly North American species and one of the three accipiter hawks. The Cooper's Hawk, being an accipiter, is essentially a woodland species and although a true forest hawk, it has adapted remarkably well to life in and around the older suburbs, especially in areas where small woodlots and trees have been allowed to stand. In size, it falls between the larger northern goshawk (*Accipiter gentiles*) and the smaller sharp-shined hawk (*Accipiter striatus*). Males are about crow size and females larger. Although it occasionally captures small rodents, especially chipmunks, it has evolved to prey upon smaller birds; it is more of a specialist in the pursuit of medium-sized birds, like mourning doves, northern flickers, American robins (*Turdus migratorius)* and other similarly sized birds.

Cooper's hawks are closely associated with deciduous and mixed forests and open woodland habitats. Nesting often occurs in man-made open clearings. Wintering habitats are similar to nesting habitats and birds are less prone to migrate then sharp-shined hawks. Home range of these hawks is relatively large. In Wisconsin, a breeding male was found to have a territory of 1,900 acres. Because of large home range, densities are quite low and 80% of prey are other avian species. Stick nests are placed in trees with overhead cover with clutch size from three to six eggs.

BBS population trends indicate that Cooper's hawks population trends are increasing in Wisconsin and in USFWS Region 3 (Sauer et al. 2004). During FY00 through 03, WS did not kill any Cooper's hawks (Table 4-1). WS, however, received 7 requests for assistance in FY00, 6 in FY01, 10 in FY02 and 16 in FY03 to protect human health and safety (*i.e.*, aviation). WS did not recommend the issuance of any DPs to the USFWS in FY03 (Table 4-3). Because Cooper's hawk populations appear to be increasing in Wisconsin and USFWS Region 3, removal of up to 20 Cooper's hawks causing damage or potentially causing damage annually (*i.e.*, bird aircraft strikes and agriculture protection) under a DP issued by the USFWS would result in a low magnitude of impact.

American Kestrel Biology and Population impacts.

American kestrels are the smallest and most common falcon in open and semi-open country, which frequently use telephone poles or wires as hunting perches and are often mistaken for a songbird. Estimates of up to 1.2 million breeding pairs have been made for the North American population (Cade et al. 1988), with an equal number thought to breed in the neotropics. Their breeding range extends as far north as central and western Alaska across northern Canada to Nova Scotia, and extends south throughout North America, into central Mexico, the Baja, and the Caribbean. They are local breeders in Central America and are widely distributed throughout South America. Most of the birds breeding in Canada and the northern United States migrate south in the winter, although some males stay as year round residents.

Kestrels consume primarily insects in the summer; however, they will also eat small rodents and birds. Wintering birds feed primarily on rodents and birds. It is possible that the use of pesticides has had an effect on them in recent decades. An even greater problem may be a scarcity of nest sites. Being a secondary cavity nester, the kestrel requires an abandoned woodpecker hole or similar cavity to nest and must often compete with starlings, an aggressive, invasive, secondary cavity nester.

BBS population trends indicate that kestrel population trends are stable in Wisconsin and have slightly increased in USFWS Region 3 (Sauer et al. 2004). During FY 00 through 03, WS did not kill any kestrels (Table 4-1). In addition, WS did not receive any requests for assistance in FY00, however, received two requests in FY01, seven in FY02 and seven in FY03 to protect human

health and safety (*i.e.*, aviation). The USFWS issued two DP in 2002 and 2003 to resolve damage to resources in Wisconsin (Table 4-3). Because kestrel populations appear healthy, are stable in Wisconsin and increasing in USFWS Region 3, removal of up to 20 kestrels causing damage or potentially causing damage annually (*i.e.*, bird aircraft strikes) under a DP issued by the USFWS would result in a low magnitude of impact.

Bald Eagle Biology and Population Impacts.

Bald eagles are unnoticeably smaller in body size and weight than golden eagles, but have a slightly wider wing span. Mature bald eagles have a distinct white head and tail and legs are unfeathered. They have a much heavier bill than golden eagles. Immature bald eagles are easily mistaken for golden eagles since the two species' coloration is similar. Bald eagles are normally found in Wisconsin near large bodies of water, rivers and creeks, and marshes. Food habits of bald eagles are varied and they partake in scavenging more often than hunt for live prey. It is not uncommon to find bald eagles feeding on livestock carcasses or carcasses of deer and other large animals killed near highways.

The bald eagle is provided Federal protection through the BGEPA which prohibits, except under certain specified conditions, the taking, possession, and commerce of such birds, and assesses penalties for violating the BGEPA. Additionally, the bald eagle is provided further protection since it is a threatened species in the conterminous (lower 48) States (50 CFR 17.11).

A total of 831 eagle nest territories were occupied by breeding adults in Wisconsin in 2002; this is an increase of 12 pairs from 2001. Eagles nested in 56 of the State's 72 counties. The number of young produced in 2002 was sufficient to support Wisconsin statewide eagle population to continue its overall growth. In addition, Wisconsin and USFWS Region 3 BBS data indicate that populations are increasing (Sauer et al. 2004). Base on population increases and range expansion, the bald eagle is proposed for delisting from protection of the ESA.

Wisconsin WS responded to seven requests for assistance during FY 00, nine during FY01, four in FY02 and four in FY03 concerning eagle damage, however, WS did not recommend the issuances of any DPs. WS works with the landowner/resource owner to find alternative methods to resolve the damage. If operational assistance is necessary, WS would initiate consultation with the USFWS and non-lethal methods would be employed, if deemed appropriate. Currently, there is only one bald eagle DP issued in USFWS Region 3 to the Minneapolis-St.Paul International Airport to harass eagles from an airport to avoid aircraft/bird strikes (M. Bulander, USFWS Region 3, 2004, pers. comm.). However, the 1992 USFWS Biological Opinion (BO) stipulates that WS is allowed the incidental take of two bald eagles nationwide per year, with the exception of the Southwestern population. The BO references that the USFWS has determined that this level of take is not likely to result in jeopardy to the species, thus, having no cumulative impacts to bald eagles. WS activities have and are expected to continue to have a low magnitude of impact on bald eagle populations.

Other Raptors and Population Impact.

In addition to the above mentioned raptors, WS receives requests for information or assistance for unidentified raptors. During FY00 through FY03, WS received 21, 28, 54, and 17, respectively, requests for information or assistance for unidentified raptors. These requests mainly consist of information for raptors that cannot be identified by the complainant. Before any lethal damage management could occur, WS would identify the species and the USFWS would need to issue a DP. The primary damage that these unidentified raptors cause or potential damage is to human health and safety (*i.e.*, aviation). WS anticipates that the annual take of these species will not

exceed more than several individuals. Therefore, WS take of several individuals of these species will have a low magnitude of impact and, take would only occur under a DP issued by the USFWS which is species specific.

Other Target Species.

Target species, in addition to the bird species analyzed above, could be killed or have nests removed in small numbers by WS during damage management activities. Most of these birds are protected by the USFWS under the MBTA and the take is limited by permit. Therefore, these birds are taken in account with applicable State and Federal laws and regulations authorizing take of migratory birds and their nest and eggs on a case-by-case basis. The USFWS, as the agency with management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on these bird populations would have no significant adverse impact on the quality of the human environment.

Based upon an anticipated increase in future requests for WS assistance, WS predicts that no more than 10 individuals and no more than 10 nests of other target species would be removed annually. None of the "other target species" are expected to be taken by Wisconsin WS at any level that would adversely affect overall bird populations and would have a low magnitude of impact.

4.3.1.2 Alternative 2 - Technical Assistance Only.

Under this alternative, WS would have no adverse effect on target species populations directly. Private efforts to reduce or prevent damage and perceived disease transmission risks to livestock or human health and safety risks could increase, resulting in increased potential impacts on those bird populations and humans. For the same reasons shown in Section 4.3.1.1, it is unlikely that starling, pigeons or other target species' populations would be adversely affected by implementation of this alternative. Impacts and hypothetical risks of illegal toxicant use would be greater under this alternative than Alternative 1. DRC-1339 and AC are currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others which could increase adverse effects however to an unknown degree.

4.3.1.3 Alternative 3 - No WS Bird Damage Management.

Under this alternative, WS would not have any impact on target species' populations in the State or region. Private efforts to reduce or prevent depredations would increase which could result in varying degrees of impacts to target species' populations. Impacts to target species under this alternative could be the same, less, or more than those of the current or proposed program depending on the level of effort expended. For the same reasons shown in the population impacts analysis in Section 4.3.1.1, it is unlikely that starlings, pigeon or most other target species populations would be adversely affected by implementation of this alternative. AC and DRC-1339 are currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce losses would lead to illegal use of toxicants by others which could increase impacts however to an unknown degree.

4.3.2 Effects of WS Bird Damage Management on Non-target Species Populations Including T/E Species.

4.3.2.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage

Management Program (No Action/Proposed Action).

Adverse Effects on Non-target (non-T/E) Species. Direct affects occur on non-target species when WS program personnel inadvertently kill, injure, or harass animals that are not target species. In general, these effects result from the use of methods that are not completely selective for target species. Non-target migratory bird species and other non-target wildlife species are usually not affected by WS' management methods, except for the occasional scaring from harassment devices. In these cases, migratory birds and other affected non-target wildlife may temporarily leave the immediate vicinity of scaring, but would most likely return after conclusion of the action. WS' take of non-target species during bird damage management activities have been extremely low and are not expected to increase above current levels of take.

According to Wisconsin WS Annual Reports, no non-target birds are known to have been killed during bird damage management from FY00 through 03. If DRC-1339 prebaiting observations or prior history suggest a likelihood of non-target bird presence, then any treated bait applied to a site would be constantly monitored to ensure that non-target birds do not arrive and consume bait. Alternatively, some type of structure or feeding station could be used that would only allow access by the target species but not by non-target birds, or the baiting is not conducted until non-target species are not present.

While every precaution would be taken to safeguard against killing non-target birds, at times changes in local flight patterns and other unanticipated events could result in the incidental death of unintended species. These occurrences are rare, have not happened during WS activities in the recent past and would not affect the overall population of any species under the current program.

Beneficial Effects on Non-target Species. Programs to reduce damage and interspecific competition between native species and invasive species can benefit native wildlife species that are adversely affected by predation or competition for habitat. Interspecific nest competition has been well documented with some non-indigenous species. Miller (1975) and Barnes (1991) reported starlings were responsible for a severe depletion of the eastern bluebird (*Sialis sialis*) population due to nest competition. Nest competition by starlings has also been known to adversely affect American kestrels (Nickell 1967, Von Jarchow 1943, Wilmers 1987), red-bellied woodpeckers (Ingold 1994, Kerpez and Smith 1990), and wood ducks (*Aix sponsa*) (Shake 1967, Heusmann et al. 1977, Grabill 1977, McGilvery and Uhler 1971). Weitzel (1988) reported nine native species of birds have been displaced by starling nest competition, and Mason et al. (1972) reported starlings evicting bats from nest holes. Reduction of nest site competition could be a beneficial effect for some native species. Although such reductions are not likely to be significant, the benefits would probably outweigh any adverse effects from non-target takes.

Interspecific brood parasitism is defined as the laying of an egg or eggs by one species of bird into a host nest of another species of birds. Unsuspecting of the egg laying, the host normally accepts and incubates the egg(s) and raises the young as their own. The brown-headed cowbird is one of five species of cowbirds that are brood parasites (Orians 1985) which have lost the instinct to nest build, egg incubate, and care for young (Smith 1977). As a result of the brood parasitism, egg and chick survival of the hosts is jeopardized. In most cases of brood parasitism, the young of the host species die because they are unable to compete with the cowbird chick for food and space inside the nest. Gulls are generally very aggressive nesting area colonizers and will force other species such as terns and plovers from prime nesting areas. The recent increase in the population of double-crested cormorants in the Great Lakes Region has also impacted colonial bird nesting areas. Besides competing for nesting space, the acidic droppings of cormorants destroy vegetation, making the area unsuitable for rapid nesting colony restoration. This alternative has the greatest possibility to successfully reduce bird damage and conflicts to wildlife

species since all bird damage management methods could be implemented or recommended by WS.

T/E Species Effects. Special efforts are made to avoid jeopardizing T/E species through biological assessments of the potential effects and the establishment of special restrictions or minimization measures. A Section 7 Programmatic Consultation and USFWS Biological Opinion between the USFWS and WS (USFWS 1992), determined that certain damage management methods could have a "may affect" on American peregrine falcons (*Falco peregrinus*), bald eagles, and whooping cranes (*Grus americana*). The BO concluded that damage management methods previously mentioned in this EA, which are used in bird damage management, will not jeopardize the continued existence or adversely modify critical habitats of those species. However, the BO did conclude that DRC-1339 may adversely affect the whooping crane. Minimization measures to avoid negative affects to T/E species, such as bait placement within or under structures, as well as label restrictions and the inherent safety of DRC-1339 preclude hazards to non-target and T/E species as described in USDA (1997 Appendix F) and in Section 3.5 of this EA. In addition, Wisconsin WS activities using DRC-1339 are primarily conducted during the winter after whooping cranes have migrated out of the area. The USFWS has determined that management activities utilized by WS for gull and cormorant damage management are not likely to adversely affect listed species. In addition, the USFWS has determined that the methods used for the management of double-crested cormorants will not likely to adversely affect the bald eagle and piping plover (USFWS 2003b). WS has determined that the use of gull and cormorant damage management methods will have no effect on those T/E species not included in USFWS (1992) or their critical habitats. Furthermore, WS has determined that the use of AC and lasers will have no effect on any listed T/E species. Further, minimization measures/SOPs would assure there would be no jeopardy to T/E species, or adverse effects on mammalian, or non-T/E bird scavengers.

WS has reviewed the current listed and candidate species and determined that the proposed action would have no affect on all listed species except the bald eagle. Bald eagle may be affected, but not likely to be adversely affected because dispersal techniques may be used to remove an eagle from airport property when risk of an aircraft/bird strike is present (S. Holtz, Bureau of Endangered Resources, WDNR letter to David Nelson, WS, May 19, 2004, J. Smith, Ecological Services, USFWS letter to David Nelson, WS, May 28, 2004 and USFWS Intraagency Consultation). SOP's listed in Chapter 3 preclude negative effects and the low non-target risk associated with WS methods precludes other adverse effects. In addition, WS bird damage management may benefit some of the species of special concern (*e.g.*, starling damage management could potentially reduce secondary nest cavity competition). In addition, listed species should benefit from this alternative because of the control in issuing permits to minimize effects at known sites (USFWS 2003c). Some disturbance could occur to listed species; however, the USFWS would monitor activities to insure no adverse effects to listed species.

Wisconsin WS has conferred with the WDNR, which has determined that the current and proposed WS action will not likely adversely affect Wisconsin State Endangered or Threatened species or their habitats and ecosystems (S. Holtz, Bureau of Endangered Resources, WDNR letter to David Nelson, WS, May 19, 2004). The WDNR provided WS a list of Endangered, Threatened and Special Concern Species in Wisconsin. WS will periodically consult with the WDNR, Bureau of Endangered Resources to ensure that no actions taken in compliance with this EA will adversely affect Wisconsin listed species. Minimization measures/SOPs to avoid T/E effects were described in Chapter 3 (Section 3.5).

4.3.2.2 Alternative 2 - Technical Assistance Only.

Adverse Effects on Non-target Species, including T/E Species. Alternative 2 would not allow any WS operational bird damage management in Wisconsin. There would be no adverse effect on non-target or T/E species from WS bird damage management under this alternative. Technical assistance or self-help information would be provided when requested to agricultural producers, airport managers, property owners, or others. Although technical assistance could lead to more selective use of bird damage management methods by private entities than that which would occur under Alternative 3, private efforts to reduce or prevent damage could result in less experienced persons implementing bird damage management methods and lead to a greater take of non-target wildlife. Hazards to raptors, whooping cranes, bald eagles, and other T/E species could be greater under this alternative than Alternative 1. It is possible that, similar to Alternative 3, frustration from the resource owner due to the inability to reduce losses could lead to illegal use of toxicants, or other non-specific damage management methods by others could lead to unknown affects to non-target species populations, including T/E species. Potential hazards and threats to raptors, whooping cranes, bald eagles and other T/E species could therefore be greater under this alternative if methods that are less selective or toxicants that cause secondary poisoning are used by frustrated private individuals.

Beneficial Effects on Non-target Species. The ability to reduce negative affects caused by birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing actions. It would be expected that this alternative would have a greater chance of reducing damage than Alternative 3 since WS would be available to provide information and advice but less than Alternative 1.

4.3.2.3 Alternative 3 - No WS Bird Damage Management.

Adverse Effects on Non-target Species. Alternative 3 would not allow any WS bird damage management in Wisconsin. There would be no impact on non-target or T/E species from WS bird damage management under this alternative. However, private efforts to reduce or prevent damage could increase; resulting in less experienced persons implementing damage management methods and could lead to greater take of non-target wildlife than the *No Action/Proposed Action* Alternative. Hazards to raptors, whooping cranes, bald eagles, and other T/E species could, therefore, be greater under this alternative than Alternative 1. As in Alternative 2, possible frustrations caused by the inability to reduce losses could lead to illegal use of toxicants by others which could impact local non-target species populations, including T/E species.

Beneficial Effects on Non-target Species. The ability to reduce negative affects caused by birds to wildlife species and their habitats, including T/E species, would be variable based upon the skills and abilities of the person implementing control actions.

4.3.3 Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets.

The effects on safety from WS bird damage management include potential benefits by fostering a safer environment by reduced disease transmission and bird/aircraft strikes, and potential negative effects that might result from the exposure of the public to bird damage management methods. WS uses chemical methods that are deemed appropriate to reduce a variety of damage problems, and WS personnel are aware of the potential risks to non-target species and humans (See Appendix C for a detailed description of bird damage management methods and chemicals potentially used by WS). The use of pesticides by WS is regulated by the EPA through the FIFRA, by State law, the WDATCP and by WS Directives. Along with effectiveness, cost and

social acceptability, risk is an important criterion for the selection of damage management strategies. Determination of risks to non-target animals, the public, and WS personnel are important prerequisites for successful application of the IWDM approach. Based on a thorough Risk Assessment (USDA 1997 Appendix P), APHIS concluded that, when chemicals used by WS, are used according to label directions, they are selective for target individuals or populations, and such use has negligible adverse effects on the environment.

4.3.3.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

Under this alternative, bird damage management conducted by WS in Wisconsin is guided by WS, APHIS, and USDA Directives, Cooperative Agreements and MOUs with other agencies, USFWS (1992), and Federal, State, and local law and regulations. WS is not aware of any record of harm or injury that has occurred to the public or pets as a result of WS bird damage management in Wisconsin. The bird damage management methods used by Wisconsin WS are discussed in more detail in Appendix C of this EA and USDA (1997) and used as prudently as possible. In addition, the current MBTA and damage management strategies will continue to address complaints on a case-by-case basis providing the most flexibility in addressing damage complaints.

Avitrol (4-Aminopyridine) is available as a prepared grain bait mixture or as a powder. It is formulated in such a way that ratios of treated baits to untreated baits are no greater than 1:9. Factors that virtually eliminate health risks to members of the public from use of this product as an avicide are:

- It is readily broken down or metabolized into compounds that are excreted in urine in the target species (EXTOXNET 1996). Therefore, little of the chemical remains in birds killed with avitrol to present a hazard to humans or pets.
- A human or pet would need to ingest the internal organs of birds found dead from Avitrol ingestion to have any chance of receiving even a minute amount of the chemical or its metabolites into their system. This is highly unlikely to occur. Furthermore, secondary hazard studies with mammals and birds have shown that there is virtually no hazard of secondary poisoning.
- Although Avitrol has not been specifically tested as a cancer-causing agent, the chemical was found not to be mutagenic in bacterial organisms. Therefore, the best scientific information available indicates it is not a carcinogen. Notwithstanding, the extremely controlled and limited circumstances in which Avitrol is used would prevent exposure of members of the public to this chemical.

The above analysis indicates that human and pet health risks from Avitrol use would be virtually nonexistent.

DRC-1339 is the primary avicide used for bird damage management in Wisconsin. This chemical is one of the most extensively researched and evaluated pesticides ever developed. More than 30 years of studies have demonstrated the safety and efficacy of this compound. Factors that help eliminate any risk of public health problems from possible future use of this chemical are:

- Its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (contrary to some misconceptions, DRC-1339 is not applied to feed materials that livestock can access).

- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours; in general, treated bait material is nearly 100% broken down within a week.
- It is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people or pets.
- Application rates are extremely low (less than 0.1 lb. of active ingredient per acre).
- A human or pet would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.
- The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) study, this chemical is not a mutagen or a carcinogen (*i.e.*, cancer-causing agent). Regardless, however, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The above analysis indicates that human and pet health risks from use of DRC-1339 would be virtually nonexistent under any alternative.

Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001) and is a common euthanasia agent apparently because of its ease of use, safety, and ability to euthanize many animals in a short time span. The advantages for using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) it is readily available and can be purchased in compressed gas cylinders, 3) it is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) it does not result in accumulation of tissue residues.

Other Bird Damage Management Chemicals. Non-lethal bird damage management chemicals that might be used or recommended by WS would include repellents such as: 1) methyl or di-methyl anthranilate (artificial grape flavoring used in foods and soft drinks sold for human consumption), which has been used as an area repellent, 2) anthraquinone, another repellent, presently marketed as Flight Control™, 3) Mesurol, a chemical repellent used for non-lethal taste aversion, and 4) the tranquilizer AC. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before EPA or Food and Drug Administration (FDA) will register them. Any operational use of these chemicals would be in accordance with labeling requirements under FIFRA, FDA and State laws and regulations which are established to avoid unreasonable adverse effects on the environment.

Following labeling requirements and use restrictions are built-in minimization measures that would assure that use of registered chemical products would avoid significant adverse effects on human or pet health. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1997).

Mechanical Damage Management Methods

Many mechanical damage management methods may be used or recommended by WS to reduce damage or the potential for damage (Appendix C). Some of these methods include:

- Resource management, which include practices that, may be used by resource owners to reduce the potential for wildlife damage.
- Cultural practices which generally involve modifications to the level of care or attention given to the resource, which may vary depending on the age, size, and location of the resource.
- Environmental/Habitat Modification is an integral part of bird damage management to not produce or attract certain bird species or to repel certain birds. Most habitat management revolves around airports and bird aircraft strike problems and blackbird and starling winter roosts.
- Animal Behavior Modification refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982).
- Live traps which are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. Traps are baited with grains or other food material, which attract the target birds.
- Egg addling/destruction is the practice of destroying the embryo prior to hatching.
- Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present, however, some birds may be removed using shooting when warranted (*i.e.*, at airports if the bird will not leave the area).
- Snap traps are wooden based rat snap traps and can be used effective in killing offending birds, such as woodpeckers damaging structures.

4.3.3.2 Alternative 2 -Technical Assistance Only Program.

Under this alternative, operational bird damage management assistance by WS would not be authorized in the State. Therefore, less selective use of methods by individuals less experienced in their application could occur. WS would only provide advice and, in some cases, equipment or materials *(i.e.,* by loan or sale) to persons who would then conduct their own damage management actions. Concerns about human or pet health risks from WS' use of bird damage management chemical methods would be alleviated because no such use would occur. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing chemical or other damage management methods and leading to a greater risk than the current and proposed action.

Commercial pest control services would be able to use Avitrol if certified and such use would likely occur to a greater extent in the absence of WS' assistance. Use of Avitrol, in accordance with label requirements, should preclude any hazard to members of the public or pets. However, hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. Frustration caused by the inability to reduce losses could lead to illegal use of toxicants by others which could lead to unknown impacts to humans and pets. Hazards to humans and pets could be greater under this alternative than Alternative 1 if chemicals that are less selective or that cause secondary poisoning are used.

4.3.3.3 Alternative 3 - No WS Bird Damage Management Program.

Alternative 3 would not allow any WS bird damage management in Wisconsin. The absence of WS bird damage management in Wisconsin could result in adverse effects on human health and safety because of the possibility of bird-borne diseases and increases in bird strikes on aircraft. Property managers fear that the absence of bird damage management activities would lead to accumulation of bird droppings and feathers (*i.e.,* pigeons, gulls, etc.) near rooftop ventilation

systems and work areas which may increase the risk of disease transmission or other health risks to humans. WS assists airport management who seek to resolve wildlife hazards to aviation in Wisconsin. Airport managers and air safety officials are concerned that the absence of a WS bird damage management program would fail to adequately address complex wildlife hazard problems faced by the aviation community. Hence, potential effects of not conducting such work could lead to an increased incidence of human injuries, property damage or loss of life due to bird strikes to aircraft.

However, commercial pest control services and private individuals would be able to use Avitrol, if certified, and such use would likely occur to a greater extent in the absence of WS' assistance, potentially resulting in less experienced persons implementing damage management methods and leading to a greater risk than the *No Action/Proposed Action* Alternative. Use of Avitrol, in accordance with label requirements, would preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants, and could pose secondary poisoning hazards to pets and to mammalian and avian scavengers under this Alternative. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

4.3.4 Efficacy of WS Bird Damage Management Methods.

Under the current program, all methods are used as effectively as practically possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Directives. The efficacy of each method is based, in part, on the application of the method, the skill of the personnel using the method and the guidance provided by WS Directives and policies for WS personnel.

The efficacy of each alternative is based on the types of methods employed under that alternative. WS personnel are trained in the use of each method, and are certified by the WDATCP as restricted-use pesticide applicators for each pesticide that is used. Some methods may be more or less effective, or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors. Because these various factors, may at times, preclude use of certain methods, it is important to maintain the widest possible selection of damage management methods to most effectively resolve bird damage problems (see Appendix C for a more detailed discussion of methods).

4.3.4.1 Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action).

The following are some methods that would be available under Alternative 1 (Appendix C).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982).

Methyl anthranilate is a non-lethal bird repellent derived from a human food additive. The chemical is effective in reducing bird food consumption and area-use and is selective in that it primarily repels birds.

Mesuoral is a chemical repellent used for non-lethal taste aversion. It is registered by the EPA for aversive conditioning egg treatment to reduce predation from common ravens,

white-necked ravens (*Corvus cryptoleucas*), and American crows on the eggs of protected species, T/E species, or eggs of other species designated to be in need of special protection (EPA Reg. No. 56228-33). Mesurol is registered for WS use only.

Anthraquinone is secondary repellent causing illness or discomfort in birds after ingestion. The effectiveness of this chemical is based on the concept of conditioned food avoidance as the chemical may cause vomiting and gastrointestinal discomfort in birds.

Alpha chloralose (AC) is delivered as bait to targeted birds and is selective and effective in immobilizing targeted individuals. Some unintentional mortality may occur due to differences in target bird weight, aggressiveness in feeding, or post baiting behavior.

Lure Crops can sometimes be used to reduce damage by providing an alternate food sources in the form of bait or crops. Lure crops are typically grains that are cultivated or placed for the sole purpose of attracting and holding the target species, thereby protecting other crop fields from damages. This method can be difficult to utilize because crop growers often have their entire cultivated properties actively engaged in commercial agriculture and if lure crop areas are not of sufficient size the risk is high that non lure crop fields will be damaged.

Lasers are selective and an effective non-lethal method to disperse some bird species under the correct lighting conditions and present virtually no health hazards to the birds (APHIS 2001).

Live traps are used in locations where a targeted population is causing damage or where other techniques cannot be safely used. Live traps, as applied and used by WS, are highly selective for target species. If a non-target is accidentally captured it would be released unharmed.

Nest box traps are effective and selective in capturing secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Snap traps are used to remove individual birds, primarily northern flickers and other woodpeckers, that are causing damage. Effectiveness can be increased by placing the traps near where the damage is occurring and by baiting the trap with food items which are highly attractive to the targeted species and less attractive to non-target birds.

Nest destruction is selective for targeted species/individuals because nests would be identified by species-specific characteristics and nesting material. Heusmann and Bellville (1978) reported this method effective, but time-consuming.

Egg addling/destruction is highly selective because the eggs of specific birds are targeted for destruction, no affects to other species would occur. This method is considered highly selective, but time consuming.

DRC-1339 – More than 30 years of studies have demonstrated the safety and efficacy of this compound. Prebaiting is conducted to monitor for the presence of non-target and target species consumption to increase efficacy.

Avitrol - Prebaiting is usually conducted to increase baiting efficacy and selectivity. Any granivorous bird associated with the target birds could be affected by Avitrol if it consumed treated bait. However, Avitrol only affects a very small number of birds in a

baited area.

Shooting is selective for target species (USDA 1997). It would also be effective as a dispersal technique or to reinforce dispersal techniques.

There are several other bird damage management methods used by WS under the current program. Appendix C provides a description of each.

4.3.4.2 Alternative 2 - Technical Assistance Only Program.

Under this alternative, WS would not have an operational bird damage management program to assist requesters to reduce bird damage. Efficacy of the WS program would not be a consideration. Assistance would be limited to providing technical assistance and instructional demonstrations on legally available methods and self-help advice.

4.3.4.3 Alternative 3 - No WS Bird Damage Management Program.

Under this alternative, WS bird damage management would not be a consideration because the Wisconsin WS program would not conduct operational activities nor provide technical assistance to entities experiencing bird damage. Private efforts to reduce or prevent damage would probably increase which could result in less efficacy in using bird damage management methods. It is reasonable to assume that frustration caused by the inability to reduce losses through legal means in a timely manner could lead to the use of illegal techniques which could result in unwanted impacts to bird populations and the environment.

4.4 CUMULATIVE EFFECTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1 and 2, WS would address damage associated with birds in situations throughout the State. The Wisconsin WS bird damage management program would be the primary Federal program with bird damage management responsibilities; however, some State and local government agencies may conduct bird damage management activities in Wisconsin as well. Through ongoing coordination and cooperation with the WDNR, WDATCP and USFWS, WS is aware of other bird damage management activities and may provide technical assistance in such efforts. WS does not normally conduct operational damage management activities concurrent with other agencies in the same area, but may conduct bird damage management activities at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct bird damage management activities in the same area. The potential cumulative impacts analyzed in this EA could occur either as a result of WS bird damage management, or as a result of the effects of other agencies and individuals. Those activities and the birds removed are tracked by the USFWS through their permitting system to insure no long-term cumulative adverse affects to bird populations. The USFWS reviews annually the take of migratory birds under standard conditions of DPs (50 CFR 21.41) and has the ability to determine if the cumulative effects of all take under DPs may be negatively affecting a species.

Cumulative Impacts on Wildlife Populations.

Bird damage management methods used or recommended by the WS program in Wisconsin will have no cumulative adverse effects on target and non-target wildlife populations. Population trend data indicate that target bird populations have remained relatively stable or increasing in Wisconsin and USFWS Region 3. When damage management actions are implemented by WS, the potential lethal take of non-target wildlife species is expected to be minimal to non-existent.

Cumulative Impact Potential from Chemical Components.

Bird damage management programs which include the use of pesticides as a lethal means to reduce damage may have the greatest potential for cumulative impacts on the environment as such impacts relate to deposit of pesticide residues in the physical environment and environmental toxicosis. DRC-1339 is the primary pesticide currently used by the Wisconsin WS bird damage management program for the purpose of reducing damage or health threats to people or livestock. This chemical has been evaluated for possible residual effects which might occur from buildup of the chemical in soil, water, or other environmental sites.

DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantities of DRC-1339 are used in the bird damage management program in Wisconsin, the chemical's instability which results in speedy degradation of the product, and application protocol used in WS programs further reduces the likelihood of any environmental accumulation.

Avitrol exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1997 and EXTOXNET 2000). Because of the characteristic of Avitrol to bind to soils, it is not expected to be present in surface or ground water as a result of its use on land. A combination of chemical characteristics and baiting procedures used by WS would reduce the likelihood of environmental accumulation of Avitrol. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns of the avicide, soil residues are expected to be low.

Based on potential use patterns, the chemical and physical characteristics of DRC-1339 and Avitrol, and factors related to the environmental fate of these pesticides; no cumulative impacts are expected from the lethal chemical components used or recommended by the WS bird damage management program in Wisconsin. Avitrol may be used or recommended by the Wisconsin WS program. Most applications would not be in contact with soil, applications would not be in contact with surface or ground water, and uneaten baits will be recovered and disposed of according to EPA label specifications.

Non-lethal chemicals may also be used or recommended by the WS bird damage management program in Wisconsin. Characteristics of these chemicals and potential use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in WS bird damage management program in Wisconsin.

Cumulative Impact Potential from Non-chemical Components.

Non-chemical methods used or recommended by WS' bird damage management program may include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and euthanasia of birds, harassment of birds or bird flocks, nest and egg destruction, and shooting.

Because shooting may be considered as a component of the non-chemical, the deposition of lead shot in the environment is a factor considered in this EA.

Lead Shot. Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species fed were observed more than one hundred years ago (Sanderson and Bellrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, Federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. *"Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. "Certain other species" refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons."*

All Wisconsin WS bird damage management shooting activities conform to Federal, State and local laws. If activities are conducted near or over water, WS uses non-toxic shot during activities. Consequently, no deposition of lead in nontoxic shot zones is likely to occur as a result of Wisconsin WS' bird damage management actions. Therefore, cumulative impacts are not likely to occur if lead shot is used. Additionally, WS will evaluate other bird damage management actions which entail the use of shot on a case-by-case basis to determine if deposition of lead shot poses any risk to non-target animals, such as domestic livestock. If such risk exists, WS will use nontoxic shot in those situations.

Roost Harassment/Relocation. Some potential exists for cumulative impacts to human health and safety related to the harassment of large flocks of birds in urban environments. If birds are dispersed from one site and relocate to another where human exposure to concentrations of bird droppings over time occurs, human health and safety could be threatened. If WS is providing operational assistance in relocating such birds, coordination with local authorities would be conducted to assure they do not re-establish in other undesirable locations.

SUMMARY

No significant cumulative environmental impacts are expected from any of the alternatives analyzed in this EA. Under the Current/Proposed Action, the lethal removal of birds by WS would not have a significant impact on overall bird populations in Wisconsin or USFWS Region 3, but some local reductions may occur. No risk to public safety is expected when WS' services are provided and accepted by requesting individuals under Alternative 1 since only trained and experienced wildlife biologists/specialists would conduct and recommend bird damage management activities. There is a slight increased risk to public safety when persons who reject WS assistance and recommendations in Alternative 1 and conduct their own bird damage management, and when no WS assistance is provided in Alternative 3. In all three Alternatives, however, it would not be to the point that the impacts would be significant. Although some persons will likely be opposed to WS' participation in bird damage management activities on public and private lands in Wisconsin, the analysis in this EA indicates that WS integrated bird damage management program would not result in significant cumulative adverse impacts on the quality of the human environment. Table 4-4 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4.4 Comparisons of Issues/Impacts and Alternatives.

Issues/Impacts	*Alternative 1*	*Alternative 2*	*Alternative 3*
Effects of WS Bird Damage Management on Target Species Populations	WS would have no affect on local bird populations. If resource owners conduct bird damage management, effects would be more or less than Alternative 2 or 3.	Affects similar to Alternative 1, however could be more adverse depending on the level of control by others.	Affects similar to Alternative 1, however could be more adverse depending on the level of control by others.
Effects on non-target species, including T/E species	No adverse affects from WS activities. Potential positive effects to those species that are being negatively impacted by invasive target species.	No adverse affects from WS activities. Potential adverse affects from others if toxicants or other methods are misused.	No adverse affects from WS activities. Potential adverse affects from others if toxicants or other methods are misused.
Risks Posed by WS Bird Damage Management Methods to the Public and Domestic Pets	No adverse affects from WS activities. Potential positive effect from reduced risks from bird disease transmissions or bird aircraft strikes.	Potential negative affect from the misuse of methods or toxicants or increase disease transmission or bird strike risks.	Potential negative affect from the misuse of methods or toxicants or increase disease transmission or bird strike risks.
Efficacy of WS Bird Damage Management Methods	Alternative provides most effective means to reduce bird damage or potential bird damage.	Moderate effectiveness if WS technical assistance recommendations are followed.	Least effectiveness because no professional assistance would be available to requesters.

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APPENDIX A

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APPENDIX B

AUTHORITY AND COMPLIANCE

USDA-APHIS-Wildlife Services

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the WS program is the Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468), which provides that:

> *"The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."*

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing "bringing (damage) under control", rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

> *"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

Further, in 2001, Congress amended WS authority in the Agriculture Appropriations Bill, which provides that:

> *"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."*

To fulfill this Congressional direction, WS conducts activities to prevent or reduce wildlife damage to agricultural, industrial and natural resources, property, and threats to public health and safety on private and public lands in cooperation with other Federal, state and local agencies, private organizations, and individuals. Therefore, wildlife damage management is not based on punishing animals but as one means of reducing damage, with actions being implemented using the WS Decision Model (Slate et al. 1992).

The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action is derived from the specific threats to resources or the public. WS' mission is to improve the coexistence of people and wildlife by providing Federal leadership to reduce problems.

Wisconsin Department of Natural Resources Legislative Authority

The WDNR, under the direction of a Governor appointed Natural Resources Board, is specifically charged by the Legislature with the management of the State's wildlife resources. Although legal authorities of the Natural Resources Board and the WDNR are expressed throughout Wisconsin Administrative Code (WAC), the primary statutory authorities include establishment of a system to protect, develop and use the forest, fish and game, lakes, streams, plant life, flowers, and other outdoor resources of the state (s. §§23.09 Wis. Stats.) and law enforcement authorities (s. §§23.10, s. 23.50, s. 29.001 and s. 29.921 Wis. Stats.). The Natural Resources Board adopted mission statements to help clarify and interpret the role of WDNR in managing natural resources in Wisconsin. They are:

- To protect and enhance our natural resources: our air, land and water; our wildlife, fish and forests and the ecosystems that sustain all life[21].
- To provide a healthy sustainable environment and a full range of outdoor opportunities.
- To ensure the right of all people to use and enjoy these resources in their work and leisure.
- To work with people to understand each other's views and carry out the public will.
- And in this partnership consider the future and generations to follow.

Conditions of permits to shoot or trap wild animals causing damage

WDNR WAC NR §§12.15 is established to define conditions of permits issued by the WDNR authorizing shooting or trapping of wild animals causing damage. General provisions for the issuance of such permits include: public use of property during open seasons, refusal of public use, compliance with all other hunting and trapping rules, carcass care and disposition, WDNR assistance in implementing permitted activities, permit kill limit, authorized area, violations and use restrictions, as well as some additional provisions.

The WDNR also approves form 2300-080, Repel and Destroy wild birds permit and application that allows WS to use registered pesticides to reduce damage caused by starlings, pigeons, and house sparrows.

Wisconsin Department of Agriculture, Trade, and Consumer Protection

The WDATCP, under the direction of a Governor appointed nine member Board of private citizens and Secretary of the WDATCP, is specifically charged by the legislature with providing consumer and business information, handling complaints, providing agricultural development and marketing services, assisting agricultural production and much more. The mission of WDATCP is to serve the citizens of Wisconsin by assuring:

- The safety and quality of food
- Fair business practices for the buyer and seller
- Efficient use of agricultural resource in a quality environment
- Consumer protection

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21 Primary control of deer disease prevention resides with the WDNR calling into question the value of any Federal process in planning and decision-making for this aspect of the program. Still, an educated and involved citizenry can help inform planners and decision-makers at all levels of government. In the circumstances, the best way in which to involve and educate citizens consistent with the State's timeframe of need is through the public NEPA process.

- Healthy animals and plants
- The vitality of Wisconsin agriculture and commerce

WDATCP administers many laws. Most of them are found in chapters 88 to 100, 126 and 136 of the Wisconsin Statutes. WDATCP has adopted rules to implement these laws. WDATCP rules are found in the WAC, Chapters ATCP 1 to ATCP 162. DATCP rules have the full force and effect of law.

U.S. Fish and Wildlife Service

The USFWS is the primary Federal agency responsible for conserving, protecting, and enhancing the Nation's fish and wildlife resources and their habitats. The USFWS mission is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Responsibilities are shared with other Federal, State, tribal, and local entities; however, the USFWS has specific responsibilities for T/E species, migratory birds, inter-jurisdictional fish, and certain marine mammals, as well as for lands and waters that the USFWS administers for the management and protection of these resources.

The USFWS regulates the taking of migratory birds under the four bilateral migratory bird treaties the United States entered into with Great Britain (for Canada), Mexico, Japan, and Russia. Regulations allowing the take of migratory birds are authorized by the MBTA (16 U.S.C. Sec's. 703 - 711), and the Fish and Wildlife Improvement Act of 1978 (16 U.S.C. Sec. 712). The Acts authorize and direct the Secretary of the Interior to allow hunting, taking, and killing of migratory birds subject to the provisions of, and to carry out the purposes of, the four migratory bird treaties.

The 1916 treaty with Great Britain was amended in 1999 by the governments of Canada and the United States. Article II of the amended United States-Canada migratory bird treaty (Treaty) states that to ensure the long-term conservation of migratory birds, migratory bird populations shall be managed in accordance with conservation principles that include (among others): 1) to manage migratory birds internationally, 2) to sustain healthy migratory bird populations for harvesting needs, and 3) to provide for and protect habitat necessary for the conservation of migratory birds.

Article III of the Treaty states that the governments should meet regularly to review progress in implementing the Treaty. The review shall address issues important to the conservation of migratory birds, including the status of migratory bird populations, the status of important migratory bird habitats, and the effectiveness of management and regulatory systems. The governments agree to work cooperatively to resolve identified problems in a manner consistent with the principles of the Treaty and, if the need arises, to conclude special arrangements to conserve and protect species of concern.

Article IV of the Treaty states that each government shall use its authority to take appropriate measures to preserve and enhance the environment of migratory birds. In particular, the governments shall, within their constitutional authority, seek means to prevent damage to such birds and their environments and pursue cooperative arrangements to conserve habitats essential to migratory bird populations.

Article VII of the Treaty authorizes permitting the take and kill of migratory birds that, under extraordinary conditions, become seriously injurious to agricultural or other interests.

The USFWS regulates take of bird species that are listed as migratory under the MBTA and those that are listed as T/E under the ESA. The USFWS cooperates with the WDNR and WS by recommending measures to avoid or minimize take of T/E species. The term *"take"* is defined by the ESA (section 3(19)) to mean *"to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."* The terms *"harass"* and *"harm"* have been further defined by USFWS

regulations (50 CFR section 17.3), as follows: 1) *harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering*; 2) *harm means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.*

The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

"From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President."

The authority of the Secretary of Agriculture, with respect to the MBTA, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

Federal Aviation Administration

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations and authorized to reduce wildlife hazards at commercial and non-commercial airports. Many of these regulations are codified in the FARs. The FAA is responsible for setting and enforcing the FARs and policies to enhance public safety. For commercial airports, 14CFR, Part 139.337 (Wildlife Hazard Management) directs the airport sponsor to conduct a wildlife hazard assessment if an air carrier aircraft experiences multiple wildlife strikes or an air carrier aircraft experiences substantial damage from striking wildlife. At non-commercial airports, the FAA also expects that the airport be aware of wildlife hazards in and around their airport and take corrective action if warranted; the FAA uses Advisory Circular 150/5200-33 to guide their decision making process.

Wisconsin Indian Tribes

Currently, Wisconsin WS does not have any MOUs with any American Indian Tribes. Any WS activities conducted on reservation lands would only be conducted at the request of the Tribe and after appropriate authorizing documents were signed. Therefore, WS would only conduct bird damage management activities on reservation lands after agreements with the Tribes to conduct such activities are in place. If WS enters into an agreement with a Tribe for bird damage management, this EA would be reviewed and supplemented if appropriate to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting bird damage management on reservation lands. Requests for operational assistance to resolve bird damage complaints on private properties within the boundaries of Indian reservations would be coordinated with tribal governments.

Compliance with Federal Laws, Executive Orders and Regulations

WS consults and cooperates with other Federal and State agencies as appropriate to ensure that all WS activities are carried out in compliance with all applicable Federal laws.

National Environmental Policy Act: All Federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). WS and the USFWS follow CEQ regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and WS follows the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and monitoring. NEPA also sets forth the requirement that all major Federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in (40 CFR, Parts 1500-1508). In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Pursuant to NEPA and CEQ regulations, this EA documents the analysis of a proposed Federal actions' impact, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into Federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

Endangered Species Act: Under the ESA, all Federal agencies are charged with a responsibility to conserve endangered and threatened species and to utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). WS conducts Section 7 consultations with the USFWS to utilize the expertise of the USFWS to ensure that, "*Any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . .*" (Sec.7 (a) (2)). WS conducts formal Section 7 Consultations with the USFWS at the national level and consultations with the USFWS at the local level as appropriate (J. Smith, Ecological Services, USFWS letter to David Nelson, WS, May 28, 2004 and USFWS Intraagency Consultation).

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as amended: The MBTA provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. The law prohibits any "*take*" of these species by private entities, except as permitted by the USFWS; therefore the USFWS issues permits to private entities for reducing bird damage (50 CFR 21.41). WS provides on-site assessments for persons experiencing migratory bird damage to obtain information on which to base damage management recommendations. Damage management recommendations could be in the form of technical assistance or operational assistance. In severe cases of bird damage, WS provides recommendations to the USFWS for the issuance of DPs to private entities. Starlings, pigeons, house sparrows and domestic waterfowl are not classified as protected migratory birds and therefore have no protection under the MBTA. USFWS DPs are also not required for "yellow-headed, red-winged, rusty, and Brewer's blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredation upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance" (50 CFR 21.43).

Federal Insecticide, Fungicide, and Rodenticide Act: FIFRA requires the registration, classification and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing FIFRA. All pesticides used or recommended by the WS program in Wisconsin are registered with, and regulated by, the EPA and the WDATCP. Wisconsin WS uses all chemicals according to label

directions as required by the EPA and WDATCP.

National Historical Preservation Act (NHPA) of 1966 as amended: requires: 1) Federal agencies to evaluate the effects of any Federal undertaking on cultural resources, 2) consult with the SHPO regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian tribes to determine whether they have concerns for traditional cultural resources in areas of these Federal undertakings. In conjunction with preparation of this EA, WS consulted with the Wisconsin State Historical Society and received that office's concurrence that WS' proposed activities would be unlikely to have any adverse effects on cultural, archeological, or historic resources (R. Dexter, WI-SHPO, pers. comm. 2003). WS provided copies of the EA and sought input from all the Wisconsin American Indian tribes and the Great Lakes Indian Fish and Wildlife Commission.

Each of the bird damage management methods described in the EA and in Appendix C that might be used operationally by WS do not cause major ground disturbance, do not cause any physical destruction or damage to property, do not cause any alterations of property, wildlife habitat, or landscapes, and do not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the proposed action are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

There is potential for audible effects on the use and enjoyment of a historic property when methods such as propane exploders, pyrotechnics, firearms, or other noise-making methods are used at or in close proximity to such sites for purposes of hazing or removing nuisance birds or other wildlife. However, such methods would only be used at a historic site at the request of the owner or manager of the site to resolve a damage or nuisance problem, which means such use would be to benefit the historic property. A built-in mitigating factor for this issue is that virtually all of the methods involved would only have temporary effects on the audible nature of a site and can be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. Site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary in those types of situations.

Environmental Justice and EO12898 - *"Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"*: Environmental Justice (EJ) is a movement promoting the fair treatment of people of all races, income and culture with respect to the development, implementation and enforcement of environmental laws, regulations and policies. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status (The EJ movement is also known as Environmental Equity -- which is the equal treatment of all individuals, groups or communities regardless of race, ethnicity, or economic status, from environmental hazards).

EJ is a priority both within APHIS and WS. EO 12898 requires Federal agencies to make EJ part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. To meet this, WS developed a strategy that: 1) identifies major programs and areas of emphasis to meet the intent of the EO, 2) minimize any adverse effects on the human health and environment of minority and low-income persons or populations, and 3) carries out the APHIS mission. To that end, APHIS operates according to the following principles: 1) promote outreach and partnerships with all stakeholders, 2) identify the impacts of APHIS activities on minority and low-income populations, 3) streamline government, 4) improve the day-to-day operations, and 5) foster non-discrimination in APHIS

programs. In addition, APHIS plans to implement EO 12898 principally through its compliance with the provisions of NEPA.

All WS activities are evaluated for their impact on the human environment and compliance with EO 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

Protection of Children from Environmental Health and Safety Risks (EO 13045): Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionably affect children, WS has considered the impacts that this proposal might have on children. The proposed bird damage management would occur by using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an adverse environmental health or safety risk to children from implementing this proposed action. In contrast, the proposed action may reduce adverse environmental health or safety risks by reducing risks (*i.e.*, disease, bird/aircraft strikes, etc.) to which children may potentially be exposed.

Executive Order 13186 and MOU between USFWS and WS: EO 13186 directs Federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between WS and the USFWS, in coordination with state, tribal, and local governments. A National-level MOU between the USFWS and WS has been drafted to facilitate the implementation of EO 13186.

Executive Order 13112 - Invasive Species: Authorized by President Clinton, EO 13112 establishes guidance to Federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control, promote public education on invasive species.

The EO also established an Invasive Species Council (Council) whose members include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the EPA. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council oversees: 1) the implementation of this order, 2) that Federal agencies activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, 3) the development of recommendations for international cooperation in addressing invasive species, 4) develop, in consultation with the CEQ, guidance to Federal agencies, 5) facilitate development of a coordinated network among federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health, 6) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, and 7) prepare and issue a national Invasive Species Management Plan.

APPENDIX C

BIRD DAMAGE MANAGEMENT METHODS AVAILABLE FOR USE IN WISCONSIN

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. IWDM would integrate and apply practical methods of prevention and reduce damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. IWDM may incorporate resource management, physical exclusion and deterrents, and population management, or any combination of these depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations and the methods under each alternative, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also given to the status of target and potential non-target species, local environmental conditions and effects, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. These factors are evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods (Table C-1) are potentially available to the WS program in Wisconsin relative to the management or reduction of bird damage. WS develops and recommends or implements IWDM strategies based on resource management, physical exclusion and wildlife management approaches. Within each approach there may be a number of specific methods or tactics available.

Table C-1. Bird Damage Management Methods which would be Recommended or Used by WS under each Alternative.

Management Method	Alternative 1 Current Program	Alternative 2 Technical Assistance	Alternative 3 No Program
Habitat Management	✔	✔	No
Lure Crops/Cultural Methods	✔	✔	No
Exclusion	✔	✔	No
Frightening Devices	✔	✔	No
Avitrol[1]	✔	✔	No
Repellents[1]	✔	✔	No
Live Traps	✔	✔	No
Shooting	✔	✔	No
DRC-1339[2, 3]	✔	No	No
Alpha-chloralose[2, 3]	✔	No	No
Euthanasia	✔	✔	No

1 Mesural is currently not registered in Wisconsin.
2 Only certified applicators could use.
3 Only registered for USDA-APHIS-WS use.

Various Federal, State, and local statutes and regulations and WS Directives govern WS use of damage management tools and substances. The following methods and materials are recommended or used in technical assistance and operational damage management efforts of the WS program in Wisconsin. The effectiveness of the program can be defined in terms of reduced economic losses, decreased health hazards, minimized property damage and overall improved quality of life.

NON-LETHAL METHODS

On rare occasions, a bird may inadvertently die from the management methods that are implemented. These birds may be killed or injured from capturing/handling procedures, or unknown causes. For example, individual bird weight, stomach contents, or physiology may make it more or less susceptible

to certain non-lethal management methods. Therefore, conditions unknown to WS or beyond WS' control may make some inadvertent mortality occur during some non-lethal damage management implementation.

Resource Management: Resource management includes a variety of practices that may be used by resource owners to reduce the potential for wildlife damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing his/her ability to manage resources pursuant to goals. Resource management recommendations are made through WS technical assistance efforts.

Alter Aircraft Flight Patterns: In cases where the presence of birds at airports results in threats to air traveler safety and when such problems cannot be resolved by other means, the alteration of aircraft flight patterns or schedules may be recommended. However, altering operations at airports to decrease the potential for hazards is not feasible unless an emergency situation exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

Relocation of damaging birds to other areas following live capture generally would not be effective or cost-effective. Since starlings, blackbirds, pigeons, and most other damaging species are common and numerous throughout Wisconsin, they are rarely if ever relocated because habitats in other areas are generally already occupied. Relocation of wildlife often involves stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats, or they simply leave the area.

However, there are exceptions to the rule for relocating birds. Relocation of damaging birds might be a viable solution and acceptable to the public when the birds were considered to have high value such as migratory waterfowl or T/E species. In these cases, WS would consult with the USFWS and WDNR to coordinate capture, transportation, and selection of suitable relocation sites.

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction would only be applied when dealing with a single or very few birds. This method is used to discourage birds from constructing nests in areas, which may create nuisances for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. This method poses no imminent danger to pets or the public.

Cultural Methods. These generally involve modifications to the level of care or attention given to the resource, which may vary depending on the age, size, and location of the resource. Husbandry practices include but are not limited to techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Agricultural Producer/Property Owner Practices. These consist primarily of non-lethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer and property owners. Producers and property owners are encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. Producer and property owner practices recommended by WS include:

Lure crops/alternate foods. When depredations cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area.

For lure crops to be effective, the ability to keep birds from surrounding fields would be necessary, and the number of alternative feeding sites must be minimal (Fairaizl and Pfeifer 1988). Additionally, lure crops reduce damage for only a short time (Fairaizl and Pfeifer 1988). The resource owner is limited in implementing this method contingent upon ownership of, or otherwise ability to manage the property. Unless the original bird-human conflict is resolved, creation of additional habitat or feeding sites could increase future conflicts.

Lure crops would likely be planted on some land held in private ownership, such as conservation clubs, throughout Wisconsin. These plantings may provide some additional food or act as an attractant for birds. However, it is highly unlikely they contribute to conflicts with birds or act as significant attractants when one considers that 13,817,000 acres of the State are in corn, wheat, hay and soybean production (Battaglia et al. 1999) which provides high quality foods for much of the year.

Environmental/Habitat Modification is an integral part of bird damage management. The type, quality, and quantity of habitat are directly related to the wildlife that are produced. Therefore, habitat can be managed to not produce or attract certain bird species or to repel certain birds. Most habitat management revolves around airports and bird aircraft strike problems in Wisconsin. Habitat management around airports is aimed at eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from runway areas. Habitat management is often necessary to minimize damage caused by blackbirds and starlings that form large roosts during late autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is the only way to permanently stop such activity (USDA 1997).

Animal Behavior Modification. This refers to tactics that alter the behavior of wildlife and reduce damages. Animal behavior modification may use scare tactics or exclusion to deter or repel birds that cause loss or damage (Twedt and Glahn 1982). Some but not all devices used to accomplish this are:

- bird proof exclusions
- auditory scaring devices (*i.e.*, electronic guards, propane exploders, pyrotechnics, distress calls and sound producing devices
- chemical frightening agents (*i.e.*, mesurol, anthraquinone)
- repellents (*i.e.*, tactile repellents, surface coverings)
- visual scare devices (*i.e.*, scarecrows, dogs, lasers, spotlights, remote control devices)
- falconry

Bird proof exclusions can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which require overhead barriers as well as conventional netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Heavy plastic strips hung vertically in open doorways have been successful in some situations in excluding birds (Johnson and Glahn 1994). Plastic strips, however, can prevent filling of the feed troughs at livestock feeding facilities or can be covered up when the feed is poured into the trough by the feed truck. They are not practical for open-air feedlot operations that are not housed in buildings. Porcupine wire can be placed on ledges to exclude birds from perching or nesting on the ledges. This too can be expensive and debris often collects in the porcupine wire making it ineffective and unsightly.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations, are often not practical in suburban, urban or rural areas if they disturb people or pets. In addition, under large feedlot situations they may not be appropriate because of the disturbance to livestock, although livestock would eventually habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics (Bomford and O'Brien 1990).

Tactile Repellents (*i.e.*, sticky or tacky bird repellents such as Tanglefoot®, 4-The-Birds®, and Roost-No-More®) smear ed or placed in wavy bands with a caulking gun will often discourage the birds from specific perches in structures, or on orchard, ornamental, and shade trees. The birds are not entrapped by the sticky substances but rather dislike the tacky footing. A word of caution: some of the sticky bird repellents will discolor painted, stained, or natural wood siding. Others may run in warm weather, leaving unsightly streaks. It is best to try out the material on a small out-of-sight area first before applying it extensively. The tacky repellents can be applied to a thin piece of pressed board, ridged clear plastic sheets, or other suitable material, which is then fastened to the area where damage is occurring.

Surface Coverings: Some birds may be excluded from ponds or other areas using overhead wire grids (Fairaizl 1992, Lowney 1993). These lines should be made visible to the birds by hanging streamers or other objects at intervals along the wires. The objective is to discourage bird feeding activities and not cause bird injury or death. Overhead wire networks generally require little maintenance other than maintaining proper wire tension and replacing broken wires, and the spacing varies with the species being excluded. They have also been demonstrated to be most applicable on areas $\leq$ two acres, but may be considered unsightly or aesthetically unappealing to some people. In addition, wire grids can render a pond unusable for boating, swimming, fishing, and other recreational activities. Installation costs are about $1,000 per surface acre for materials. The expense of maintaining wire grids may be burdensome for some people.

Balls approximately five inches in diameter can be used to cover the surface of a pond. A "ball blanket" renders a pond unusable for boating, swimming, fishing, and other recreational activities. This method is very expensive, costing about $131,000 per surface acre of water.

Scarecrows: The use of scarecrows has had mixed results. These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972, Bomford and O'Brien 1990). Mylar tape has produced mixed

results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988). In general, scarecrows are most effective when they are moved frequently, alternated with other methods, and are well maintained.

Dogs: Dogs can be effective at harassing birds and keeping them off turf and beaches (Conover and Chasko 1985, Woodruff and Green 1995). Around water, this technique appears most effective when the body of water to be patrolled is ≤ 2 acres in size (Swift 1998). Although dogs can be effective in keeping birds off individual properties, they do not contribute to a solution for the larger problem of overabundant/anthropogenic abundant bird populations (Castelli and Sleggs 1998). Swift (1998) and numerous individuals in Wisconsin have reported that when harassment with dogs ceases, the number of birds usually return to pre-treatment numbers. WS has recommended and encouraged the use of dogs where appropriate.

Lasers are a relative new technique used to frighten and disperse birds from their roosts or loafing areas. Although the use of a laser (the term of "laser" is an acronym for Light Amplification by Simulated Emission of Radiation) to alter bird behavior was first introduced nearly 30 years ago (Lustick 1973), it received very little attention until recently when it was tested by the NWRC. Results have shown that several bird species, such as double-crested cormorants, Canada geese, other waterfowl, gulls, vultures (*Cathartes aura* and *Coragyps atratus*), and American crows have all exhibited avoidance of laser beams during field trails (Glahn et al. 2001, Blackwell et al. 2002). The repellent or dispersal effect of a laser is due to the intense and coherent mono-wavelength light that, when targeted at birds, can have substantial effects on behavior and my illicit changes in physiological processes (APHIS 2001). Best results are achieved under low-light conditions (*i.e.*, sunset through dawn) and targeting structures or tree proximate to roosting birds, thereby reflecting the beam. In field situations, habituation to lasers has not been observed (APHIS 2001).

The avian eye generally filters most damaging radiation (*e.g.*, short-wavelength radiation from the sun). In tests conducted with double-crested cormorants exposed to a relatively low-power Class-III B laser at a distance of 1 meter, no ocular damage was noted (APHIS 2001). However, unlike birds, the human eye, with the exception of the blink reflex, is essentially unprotected from thermal damage to retinal tissue associated with concentrated laser radiation. Lasers used by WS include the Class-III B, 5-mW, He-Ne, 633-nm Desman laser, and the Class II, battery-powered, 68-mW, 650-nm, diode Laser Dissuader. Because of the risk of eye damage, safety guidelines and specifications have been developed and are strictly followed by the user (Occupational Safety and Health Administration 1991, Glahn and Blackwell 2000).

Spotlights. The use of light to disturb or move loafing and or roosting birds can be an effective technique. This method is similar to the laser, but has a much reduced price. The sacrifice in reduced pricing also limits the range and effectiveness of this method when compared to the laser.

Remote Control Devices. The use of remote control devices for the purpose of disturbing the activity or behavior of birds is a relatively new concept. These devices have been in existence for many years, but their durability, range, strength and cost have improved dramatically. Remote control devices are available in numerous forms such as: speed boats, helicopters, airplanes, sail boats, race cars, etc.

Falconry is the practice of using falcons and hawks to chasing/hunt other wildlife species and return to the handler. It is regulated under both Federal and State laws and all raptors in the United States are protected under various statutes; any "take" of a raptor must be done under the appropriate

permit to be legal. The care and housing of falcons can be expensive (Chamorro and Clavero 1994) and there are drawbacks to using falcons to disperse birds from damage or potential damage sites (Hahn 1996) (*i.e.,* falcons are generally only flown when weather and lighting condition permit).

Live traps include:

Clover, funnel, and common pigeon traps are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. The entrances of the traps also vary greatly from swinging-door, one-way door, funnel entrance, to tip-top sliding doors. Traps are baited with grains or other food material, which attract the target birds. WS' standard procedure when conducting trapping operations is to ensure that an adequate supply of food and water is in the trap to sustain captured birds for several days. Active traps are checked daily, every other day, or as appropriate, to replenish bait and water and to remove captured birds.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no langer to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps are used by WS for corrective damage management and are effective in capturing local breeding and post breeding starlings and other targeted secondary cavity nesting birds (DeHaven and Guarino 1969, Knittle and Guarino 1976).

Mist nets are more commonly used for capturing small-sized birds such as house sparrows, finches, etc. but can be used to capture larger birds such as ducks and ring-neck pheasants (*Phasianus colchicus*). It was introduced in to the United States in the 1950's from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets/rocket nets are normally used for larger birds such as pigeons, feral ducks, and waterfowl and use mortar projectiles to propel a net up and over birds, which have been baited to a particular site. This type of net is especially effective for waterfowl that are flightless due to molting and other birds which are typically shy to other types of capture.

Pole traps are generally set for raptors which perch on poles prior to making an attack. Problem hawks and owls can be safely trapped using a well padded (*i.e.,* with foam rubber wrapped in electricians tape, surgical tubing) steel leg-hold trap (No. 1½ or other appropriate size), snare or tangle snares set on the top of poles. Poles that are 5 to 10-foot high near the threatened area where they can be seen easily and place one padded trap on top of each pole. The wire is run through the trap ring and the wire is secured to the pole and ground so that trapped birds may slide

to the ground where the bird can rest.

Bal-chatri traps are small traps used for capturing birds of prey such as hawks and eagles. Live bait such as pigeons, starlings, rodents, etc. is used to lure raptors into landing on the trap (Hygnstrom and Craven 1994) where nylon nooses entangle their feet and hold the bird. The trap is made of chicken wire or other wire mesh material and formed into a Quonset hut shape cage which holds the live bait. The outside top and sides are covered with many nooses consisting of strong monofilament line or stiff nylon string.

Chemical Repellents

Methyl anthranilate (MA) (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. MA is currently registered as a repellent to protect turf from bird grazing and as a spray for airport runways to reduce bird activity/risk on or near airports. It is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or the FDA.

Mesurol is a chemical repellent used for non-lethal taste aversion. It is registered by the EPA for aversive conditioning egg treatment to reduce predation from common ravens, white-necked ravens (*C. cryptoleucas*), and American crows on the eggs of protected, T/E species, or eggs of other species designated to be in need of special protection (EPA Reg. No. 56228-33). Mesurol is registered for WS use only. The active ingredient is methiocarb which is a carbamate pesticide which acts as a cholinesterase inhibitor. Species which feed upon treated eggs may show signs of toxicity (*e.g.* regurgitation, lethargy, temporary immobilization). Occasionally, birds may die after feeding upon treated eggs, but most birds exposed to treated eggs survive. Avery et al. (1995) examined the potential of using eggs injected with 30mg of mesurol to condition ravens from preying on eggs of endangered California least terns (*Sterna antillarum*). The result concluded that proper deployment of treated eggs can be a useful, nonlethal method of reducing raven predation at least tern colonies. Avery and Decker (1994) evaluated whether predation might be reduced through food avoidance learning. They used captive fish crows (*Corvus caurinus*) to examine avoidance response from mesurol (18mg/egg) and MA (100mg/egg). Their conclusion showed that some crows displayed persistence to the 5-day exposure and that successful application may require extended period of training for target predators to acquire an avoidance response. During the spring of 2001, WS conducted a field test on the Sterling Wildlife Management Area in Bingham County, Idaho, where mesurol treated eggs were exposed to black-billed magpies (*Pica pica*) to evaluate aversive conditioning to eggs of waterfowl and upland game birds. Magpies feeding on treated eggs decreased after a short period of time, however, their feeding behavior switched to pecking holes in eggs, possibly trying to detect treated eggs before consuming them. This behavior may suggest that at least some birds experienced the ill effects of mesurol, but the *"tasting"* of eggs may result in increased predation (Maycock and Graves 2001).

Anthraquinone (Flight Control™), a non-lethal repellent not currently registered for use on gulls or cormorants in some states, could be considered for use if it becomes registered in Wisconsin in the future. As part of the planning process, analyses of potential effects of this repellant are being addressed in this EA to determine potential effects if and when Anthraquinone becomes registered for use in Wisconsin on species other than Canada geese. Similar to MA, this chemical could be used to cause a negative response to feeding in treated areas.

In the United States, the use of anthraquinione as a bird repellent dates at least from the 1940's when the first patent for its use was issued (Avery 2003). Subsequent development and testing of the chemical centered on seed treatments, particularly for pine seeds and rice. It is registered as a treatment to repel birds from turf and grass and as a repellent for roosting birds. Additional bird-repellent applications are being developed for rice and corn seed treatments and aerial application to ripening rice (Avery 2003).

Anthraquinone is a secondary repellent and affects birds by causing post-intestinal distress. Sometimes ingestion of anthraquinone-treated food produces vomiting, but often vomiting does not occur and the bird just sits quietly until the discomfort passes. Anthraquinone is not a taste repellent or contact irritant as the birds do not hesitate to eat treated food, and they exhibit no sign that treated food is unpalatable to them. However, once the birds experience the adverse consequences they learn to avoid the protected food.

Anthraquinone is a stable compound and virtually insoluble in water and there are no known hazards to non-target species from repellent application of anthraquinone It is not phytotoxic and does not inhibit germination of rice seeds or growth of sprouts. It also has a very low toxicity to birds and mammals, and it appears to be innocuous to insects (Avery 2003).

Avitrol is a chemical frightening agent (repellent) that can be effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely non-lethal in that a small portion of the birds could be killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. Avitrol treated bait is placed in an area where the targeted birds are feeding and a few birds consume treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby, frightening the remaining flock away. Avitrol is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring in Wisconsin. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to reduce its bioavailability in aqueous media, is non-accumulative in tissues and rapidly metabolized by many species (Schafer 1991). Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only magpies and crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that magpies exposed to two to 3.2 times the published Lethal Dose (LD_{50}) in contaminated prey for 20 days were not adversely affected and three American kestrels were fed contaminated blackbirds for seven to 45 days were not adversely affected. Therefore, no probable risk is expected, based on low concentrations and low hazards quotient value for nontarget indicator species tested on this compound. No probable risk is expected for pets and the public, based on low concentrations and low hazards quotient value for non-target indicator species tested on this compound.

Alpha chloralose (AC) is a chloral derivative of glucose and a central nervous system depressant (*i.e.*, depresses cortical centers in the brain) used as an immobilizing agent to capture and remove

nuisance waterfowl and other birds, and for capture of birds for research purposes[22]. It is labor intensive and in some cases, may not be cost effective depending on the application and purpose (Wright 1973, Feare et al. 1981), but is typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts and for the capture of birds for research. AC is typically delivered as a well contained bait in small quantities with minimal hazards to pets and humans and the target birds; single bread or corn baits are fed directly to the target birds. WS personnel or other authorized personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment.

USDA APHIS is currently authorized by FDA to use AC to capture waterfowl, coots, pigeons and ravens under Investigative New Animal Drug (INAD) 6602 under a category of nuisance animals. In addition, FDA granted a one-time use of AC to capture sandhill cranes for marking and research purposes[23]; reauthorization is being requested from the FDA to continue AC for crane research. Based on existing data showing the effectiveness and relative safety of AC to tranquilize and capture cranes (Langenberg et al. 1998, Hayes et al. 2003), APHIS is requesting FDA grant use of AC to capture sandhill cranes under the same regulatory categorization use for capture of waterfowl, coots, pigeons and ravens.

AC was eliminated from more detailed analysis in USDA (1997) based on critical element screening; therefore, environmental fate properties of this compound were not rigorously assessed. However, the solubility and mobility are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. AC is used in other countries as an avian and mammalian toxicant. The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about 2 to 30 times lower than the LD_{50}. Mammalian data indicate higher LD_{50} values than birds. Toxicity to aquatic organisms is unknown (Wornecki et al. 1990) but the compound is not generally soluble in water and therefore should remain unavailable to aquatic organisms. Factors supporting the determination of this low potential included the lack of exposure to pets, nontarget species and the public, and the low toxicity of the active ingredient. Supporting rationale for this determination included relatively low total annual use and a limited number of potential exposure pathways

LETHAL METHODS

Egg addling/destruction is the practice of destroying the embryo prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen. Although WS does not commonly use egg addling or destruction, it is a valuable damage management tool and has shown to be effective.

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when a large number of birds are present. Normally shooting is conducted with shotguns or air rifles.

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22 With proper use and follow-up, AC reduces the potential for stress, injury and death in many situations over other capture techniques.

23 AC has been used by WS and the International Crane Foundation to capture sandhill cranes for an on-going research project.

Shooting is a very individual specific method and is normally used to remove a single offending bird, or group of birds numbering less than 50 at one location. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center-fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting bird damage management activities, and laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Hunting and DPs. WS sometimes recommends that resource owners consider legal hunting as an option for reducing game bird species damage. Although legal hunting is impractical and/or prohibited in many urban/suburban areas, it can be used to reduce some populations of game birds. Legal hunting also reinforces harassment programs (Kadlec 1968). WS may recommend that resource owners receive DPs from the USFWS to legally take bird species that are protected under the MBTA. In these situations, WS will investigate the complaint and provide this information to the USFWS either recommending or denying the permit application by submitting a Form 37 (Migratory Bird Damage Project Report).

Table C-2. Chemicals Used by Wisconsin WS.

FY	EPA Reg.	Species	Quantity Used (Grams)	
			DRC-1339	Alpha-chlorolose
03	56228-10	Starlings	382	
	56228-28	Pigeons	26	
	INADA-6602	Sandhill Cranes		3.7
02	56228-10	Starlings	25	
	56228-28	Pigeons	13	
01	56228-10	Starlings	0	
	56228-28	Pigeons	0	
00	56228-10	Starlings	0	
	56228-28	Pigeons	0	

DRC-1339 is the principal chemical method that would be used for blackbird, starling, and pigeon damage management in the current program and proposed action (Table C-2). For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon damage management at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving blackbird and starling problems at feedlots (West and Besser 1976, Glahn 1982, Glahn et al. 1987); research studies and field observations suggest DRC-1339 treatments kill about 75% of the starlings at cattle feeding facilities (Besser et al. 1967). Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban pigeon population reduction. Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice.

DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds, and mammals. For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species, such as raptors, sparrows, and eagles, are classified as nonsensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to nontarget and T/E species (USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and European starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent. DRC-1339 acts in a humane manner producing a quiet and apparently painless death. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (*i.e.*, degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment concluded that no adverse effects are expected from use of DRC-1339.

DRC 1339 has several EPA Registration Labels (56228-10, 56228-17, 56228-28, 56228-29, and 56228-30) depending on the application or species involved in the damage reduction project.

Snap traps. Wooden based rat snap traps can be effective in killing offending birds, usually woodpeckers. The trap is nailed to the building with the trigger pointed downward alongside the area of the building sustaining the damage. The trap is baited with nut meats (walnuts, almonds, or pecans) or suet. If multiple areas are being damaged several traps can be used.

Carbon dioxide (CO_2) gas is a colorless, odorless, noncombustible gas approved by the AVMA as a euthanasia method (Beaver et al. 2001). CO_2 is a common euthanasia agent apparently because of its ease of use, safety, and ability to euthanize many animals in a short time span. The advantages for using CO_2 are: 1) the rapid depressant, analgesic, and anesthetic effects of CO_2 are well established, 2) CO_2 is readily available and can be purchased in compressed gas cylinders, 3) CO_2 is inexpensive, nonflammable, nonexplosive, and poses minimal hazard to personnel when used with properly designed equipment, and 4) CO_2 does not result in accumulation of tissue residues. CO_2 has been used to euthanatize mice, rats, guinea pigs, chickens, and rabbits, and to render swine unconscious before humane slaughter. Studies of 1-day-old chickens have revealed that CO_2 is an effective euthanatizing agent. Inhalation of CO_2 caused little distress to the birds, suppresses nervous activity, and induced death within 5 minutes. In addition, inhalation of CO_2 at a concentration of 7.5% increases the pain threshold, and higher concentrations of CO_2 have a rapid anesthetic effect.

WS sometimes uses CO_2 to euthanize birds which have been captured in live traps, by hand, or by chemical immobilization and when relocation is not feasible. Live birds are placed in a container or chamber and CO_2 gas from a cylinder is released into the chamber. The birds quickly expire after inhaling the gas.